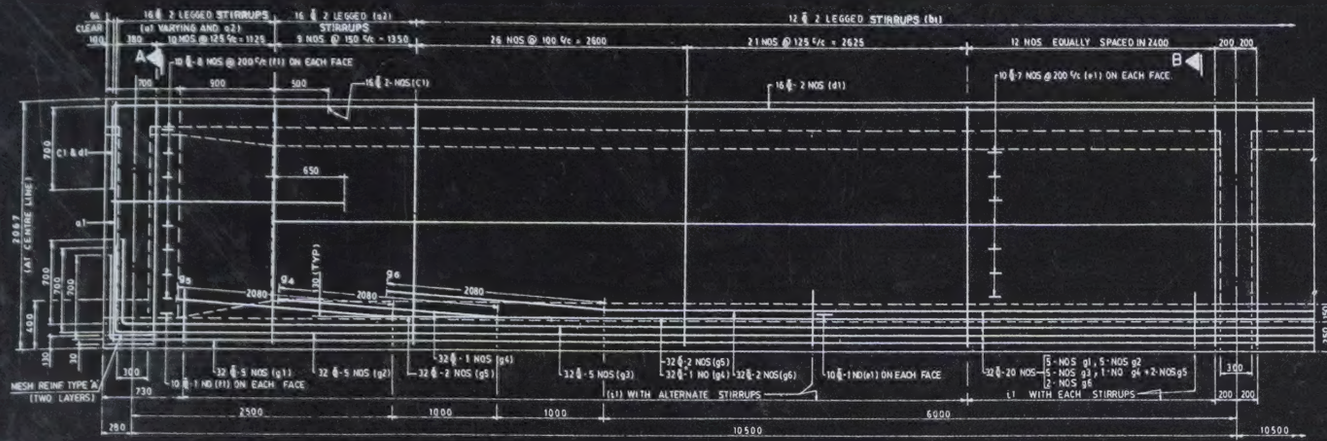
16 ϕ 2 LEGGED STIRRUPS (a1) VARYING AND a2)
16 ϕ 2 LEGGED (a2) STIRRUPS
12 ϕ 2 LEGGED STIRRUPS (b1)
10 NOS @ 125 c/c = 1125
9 NOS @ 150 c/c = 1350
26 NOS @ 100 c/c = 2600
21 NOS @ 125 c/c = 2625
12 NOS EQUALLY SPACED IN 2400
10 ϕ-8 NOS @ 200 c/c (f1) ON EACH FACE
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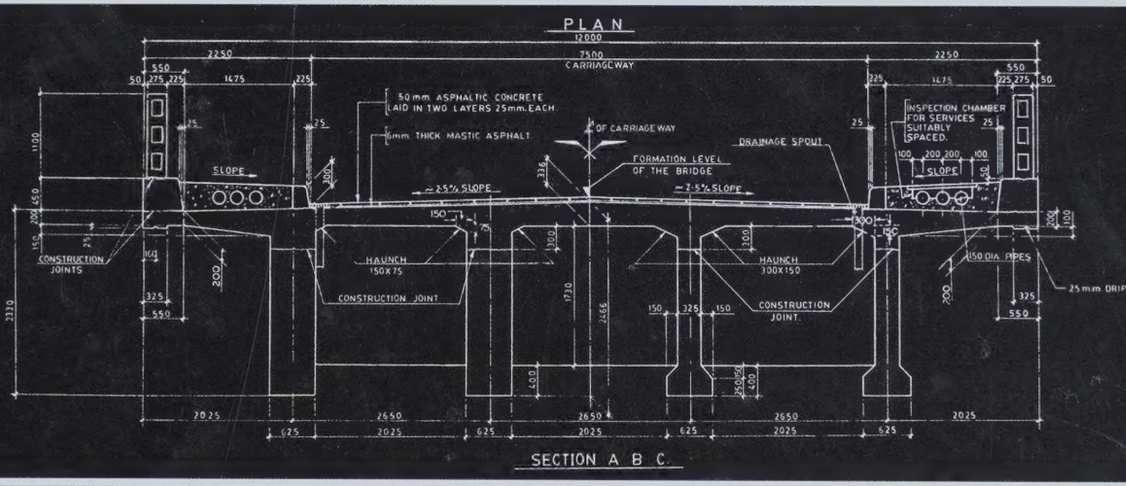
32 ϕ-5 NOS (g2)
32 ϕ-1 NOS (g4)
32 ϕ-2 NOS (g5)
32 ϕ-5 NOS (g3)
32 ϕ-2 NOS (g5)
32 ϕ-1 NO (g6)
32 ϕ-2 NOS (g6)
10 ϕ-1 NO (e1) ON EACH FACE
(f1) WITH ALTERNATE STIRRUPS
32 ϕ-20 NOS
5-NOS g1, 5-NOS g2
5-NOS g3, 1-NO g4 + 2-NOS g5
2-NOS g6
f1 WITH EACH STIRRUPS
2500
1000
1000
6000
10500
10500

NOTES

1. Longitudinal girders shall be given upword camber on account of dead load deflection as given in the Table-1.
2. 32 spacer bars shall be provided @ 1m c/c between two tiers of longitudinal bars girders.
3. This drawing shall be read in conjunction with the following drgs.

I) General notes Drg. No. SD/200.
II) Details of elastomeric bearing Drg. No. SD/2003.
III) Details of rocker and roller bearing Drg. No. SD/204.
IV) General arrangement (for bridges without footpaths) Drg. No. SD/210.
V) General arrangement (for bridges with footpaths) Drg. No. SD/211.
VI) Details of deck slab (for bridges without footpaths) Drg. No. SD/212.
VII) Details of deck slab (for bridges with footpaths) Drg. No. SD/213. Footpaths)

STANDARD PLANS FOR HIGHWAY BRIDGES



सत्यमेव जयते

MINISTRY OF SURFACE TRANSPORT
ROADS WING
NEW DELHI
1991

CONTENTS

DETAILS FOR EFFECTIVE SPAN FROM 10m TO 24m WITH 12m WIDTH
BEARINGS
RAILINGS
DRAINAGE

R. C. C. T-BEAM AND SLAB SUPERSTRUCTURE

Ministry of Surface Transport
(Roads Wing)

STANDARD PLANS FOR HIGHWAY BRIDGES

R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE

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FOREWORD

I have great pleasure in placing before the community of Bridge Engineers, this Volume of Standard Plans for Highway Bridges covering RCC T-Beam and slab type superstructure. This publication is the second in the series of new Standard Plans for highway bridge superstructure being brought out keeping in view the recent changes in specifications and provisions in the Bridge Codes. I am sure this publication will prove extremely useful in proper planning, estimation and execution of highway bridges in the country.

The publication has been made possible by the sustained efforts of the personnel of the Bridges Standards and Research Zone of the Bridges Directorate of this Ministry and the Consultant associated with the work, who deserve commendation for the work done by them. The keen interest of the Addl. Director General (Bridges), in taking up this work and bringing out this publication in a short time is worthy of special mention.

(K. K. SARIN)
Director General (Road Development)
& Addl. Secretary to the Govt. of India

New Delhi, June 1, 1991

PREFACE

The Standard Plans for Highway Bridges with RCC T-Beam and Slab Type Superstructure (Volume III) were first issued by the Ministry of Surface Transport (Roads Wing) in the year 1980. Since then there have been several revisions in the specifications and provisions of the Bridge Codes. The preparation of revised Standard Drawings was, therefore, taken up towards the end of 1989, and completed on top priority.

This Volume, the second in the series of new Standard Drawings for Superstructure, contains Standard Plans for RCC T-Beam and Slab Type highway bridge superstructure for 10, 12, 14, 16, 18, 21 and 24 metre effective spans. It also contains drawings for bearings, wearing coat, railings and miscellaneous items. A separate Volume containing bill of quantities for various items of superstructures will also be issued shortly.

The design caters for one lane of IRC Class 70-R wheeled/tracked loading or 2-lanes of IRC Class A loading whichever produces more severe effect. Footpaths have been designed for a crowd load of 5 kn/m^2. Keeping in view the current practice of providing a deck of the same width as the adjoining road for NH bridges having total length less than 30 m, the overall width between the outer faces of the railing kerb has been kept as 12 m. The wearing coat will be of mastic and asphaltic conrete type, except in remote areas where average 75 mm thick cement concrete wearing coat may also be adopted. The designs are based on Standard Specifications and Codes of Practice for Highway Bridges issued by the Indian Roads Congress. For construction purposes, Specifications for Road and Bridge works issued by the Govt. of India, Ministry of Surface Transport (Roads Wing), as amended from time to time will apply.

The plans have been made complete in all respects so that they could be readily adopted for preparation of estimates and also serve as construction drawings in the field. The entire design philosophy adopted lays great emphasis on constructability i.e. convenient and full translation of the design on to the ground. A great deal of attention has, therefore, been paid to dimensioning and detailing so as to ensure proper placing and compacting of conrete. I have no doubt that the widespread adoption of these Standard Plans will lead to reduction in time of construction and enhancement of the quality and durability of our road bridges.

Every possible care has been taken to eliminate errors in the Drawings, but users are requested to bring to our notice errors or omissions, if any, which may come to light while using these Drawings in their bridge works.

The work of preparing the Designs and Drawings was carried out by the Consultant, M/s. Gilcon Project Services Ltd., Calcutta. Equally important contributions in the finalization of the designs and details were made by officers of the Ministry whose names appear in the title blocks of various Drawings. The enthusiasm and dedication which they brought to bear on the task are to be highly appreciated.

NINAN KOSHI
Addl. Director General (Bridges)
Ministry of Surface Transport (Roads Wing),

New Delhi, June 1, 1991

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DRG. NO. SD/200

(A) GENERAL

These notes are applicable for the Standard Drawings for R.C.C. T-beam and slab superstructure with and without footpaths.

These drawings are applicable only for right bridges with overall width of 12 m.

No raised footpath shall be provided on the bridges having length less than 30m, unless the same are otherwise existing on the approaches.

All dimensions are in millimetres unless otherwise mentioned. Only written dimensions shall be followed. No drawing shall be scaled.

5 **Design criteria :**

The design is according to the following codes :

(a) IRC : 5-1985
(b) IRC : 6-1966 (1985 reprint)
(c) IRC : 21-1987
(d) IRC : 83-1982 (Part-I)
(e) IRC : 83-1987 (Part-II)

The following loads have been considered in the design :

(a) One lane of IRC class 70R or two lanes of IRC class A on carriageway, whichever governs
(b) Footpath load of 5 KN/sq.m for superstructure having footpaths
(c) Wearing coat load of 2 KN/sq.m.

Temperature variation = ± 25° C

Horizontal seismic coefficient : (α , β , λ)
Refer clause 222 of IRC 6-1966, Reprint-1985)

For elastomeric bearings	For metallic bearings
0.075	0.180

The designs are applicable for 'MODERATE' and 'SEVERE' conditions of exposure.

Provision of elastomeric bearing or metallic bearing shall be decided by the Engineer-in-charge and shall be incorporated in the drawing showing general arrangement of superstructure during project preparation.

Public utility services (except water supply and sewerage) if required, shall be carried over the bridge through 150 mm diameter ducts provided in the footpaths. Total load of such services shall not be more than one KN per metre on each footpath. Water/sewerage pipe line shall not be carried over any part of superstructure. Inspection chamber in footpaths may be provided as shown in the drawing. The location and spacing of chambers along the footpath will be decided by the Engineer-in-charge in consultation with the user(s).

Wearing coat shall consist of the following :

A coat of mastic asphalt 6mm thick, with a prime coat over the top of the deck before the wearing coat is laid. The prime coat of mastic asphalt shall be 30% straight run 30/40 penetration grade bitumen and 50% light solvent (Benzol) to be laid over the deck slab. The insulating layer 6mm thick mastic asphalt with 75% lime stone dust filler and 25% of 30/40 penetration grade bitumen shall be laid at 375°F with broom over prime coat.

II. 50 mm thick asphaltic concrete wearing coat in two layers of 25 mm each as per Clause 512 of M O S T's Specifications for Road and Bridge Works (Second revision, 1988).

In case of isolated bridge construction or bridges located in remote areas where provision of mastic and asphaltic concrete wearing coat is not practicable, the Engineer-in-charge may permit provision of 75mm thick cement concrete wearing coat in M 30 grade concrete as shown in the Drawing.

In urban areas, chequered tiles may be provided in the footpath portion by suitably adjusting the thickness of the footpath slab.

(B) MATERIALS SPECIFICATIONS

Concrete :

I. Concrete shall be design mix and shall have minimum 28 day's characteristic strength on 150mm cubes as 25 MPa for 'MODERATE' condition of exposure and 30 MPa for 'SEVERE' condition of exposure

2. High strength ordinary portland cement conforming to IS : 8112 or ordinary portland cement conforming to IS : 269 capable of achieving the required design concrete strength shall only be used.

3. To improve workability of concrete, admixtures conforming to IS : 6925 and IS : 9103 may be permitted subject to satisfactory proven use. Admixtures generating hydrogen, nitrogen etc. should not be used.

4. Cement content in concrete shall not be less than 310 kg/cu.m of concrete for 'MODERATE' environment and 400 kg/cum of concrete for 'SEVERE' environment.

5. Maximum water cement ratio shall be 0.45 for 'MODERATE' environment and 0.40 for 'SEVERE' environment.

Reinforcement :

All reinforcing steel shall be of High Yield Strength Deformed Bars (Grade designation S 415) conforming to IS : 1786 (except for mesh reinforcement which shall be M S bars Grade designation S 240 conforming to IS : 432 part-I mild steel).

Water :

Water to be used in concreting and curing shall conform to Clause 302.4 of IRC : 21-1987.

Expansion Joints:

I. The expansion joints must be robust, durable, water tight and replaceable. It must be provided over the full width of superstructure including kerb and footpath following the profile of the same (where relevant). Expansion joints shall be obtained only from approved manufacturers and be of proven type. Details of expansion joints may be got approved before commencement of construction. Site fabricated expansion joints shall be prohibited.

2. The expansion joint shall have the following additional essential features :

i. It shall cater for a total movement of 20 mm with original gap of 40 mm between concrete faces.
ii. It shall be either from elastomer or shall have a cushion of elastomer to enable absorption of shock transmitted by vehicles.

3. Fabricated steel parts in the nosing of expansion joints shall be positioned accurately before the concreting of that portion of the deck slab.

4. Presence of manufacturer's representative at the time of concreting of nosing and installation of expansion joints is mandatory.

Bearings :

I. Metallic bearings shall conform to IRC : 83-1982 (part-I).
2. Elastomeric bearings shall conform to IRC : 83-1987 (part-II).

(C) WORKMANSHIP / DETAILING

I. Minimum clear cover to all reinforcement including stirrups shall be 50 mm unless shown otherwise in the drawings.

2. For ensuring proper cover of concrete to reinforcement specially made polymer cover blocks shall only be used.

3. **Construction Joints :**

i. Construction joints shall be provided only at locations shown on the drawings. Concreting operation shall be carried out continuously up to the construction joints.

ii. The concrete surface at the joint shall be brushed with a stiff brush after casting while the concrete is still fresh and it has only slightly hardened.

iii. Before new concrete is poured, the surface of old concrete shall be prepared as under :

(a) For hardened concrete, the surface shall be thoroughly cleaned to remove debris and laitance and made rough so that 1/4 of the size of aggregate is exposed but without dislodging the aggregate or structurally damaging the concrete.

(b) For partially hardened concrete, the surface shall be treated by wire brush followed by an air jet. The old surface shall be soaked with water, without leaving puddles, immediately before starting concreting to prevent absorption of water from new concrete.

iv. New concrete shall be thoroughly compacted in the region of the joint.

4. Welding of reinforcement bars shall not be permitted.

5. Laps in reinforcement :

i. Minimum lap length of reinforcement shall be kept as 83 d where d is the diametre of bar.
ii. Not more than 50% of reinforcement shall be lapped at any one location.
iii. For closely spaced bars lapping may be avoided by providing suitable type of mechanical splices

6. Bending of reinforcement bars shall be as per IS:2502.

7. Supporting chairs of 12mm diameter shall be provided at suitable intervals as per IS : 2502.

8. Concrete shall be produced in a mechanical mixer of capacity not less than 200 litres having integral weigh-batching facility and automatic water measuring and dispensing device.

9. Proper compaction of concrete shall be ensured by use of form and/or needle vibrators. Use of full width screed vibrators for compaction of concrete in deck slab shall be ensured.

10. Shuttering plates shall suitably be stiffened to enable the compaction by form vibrators.

11. Sharp edges of concrete shall be chamfered.

12. The location of jacks for lifting up the superstructure to replace bearings etc. is shown thus ↑. This shall be distinctly etched on end cross girders and pier / abutment caps.

(D) SPECIFICATIONS

The work shall be executed in accordance with M O S T Specifications for Road & Bridge Works (2nd revision, 1988) except where-ever otherwise mentioned.

(E) REFERENCE TO DRAWINGS

Drawing No.	Title
Drg. No. SD/201	Details of R.C.C. railings (for bridges without footpaths).
Drg. No. SD/202	Details of R.C.C. railings (for bridges with footpaths).
Drg. No. SD/203	Details of elastomeric bearings.
Drg. No. SD/204	Details of rocker and roller bearings.
Drg. No. SD/205	Details of miscellaneous items.

MKD	DATE	DESCRIPTION	BY

REVISION

GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
(ROADS WING), NEW DELHI.

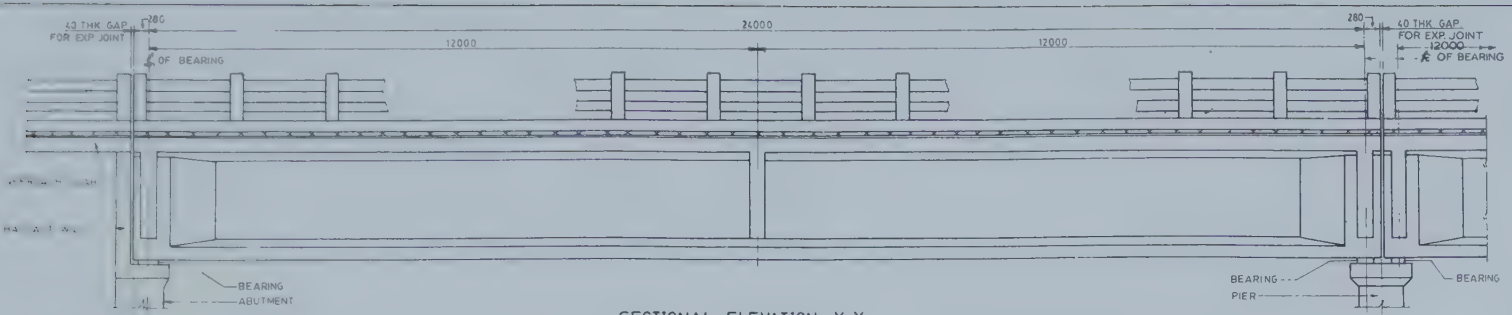
STANDARD DRAWINGS FOR ROAD BRIDGES

R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE
WITH AND WITHOUT FOOTPATHS

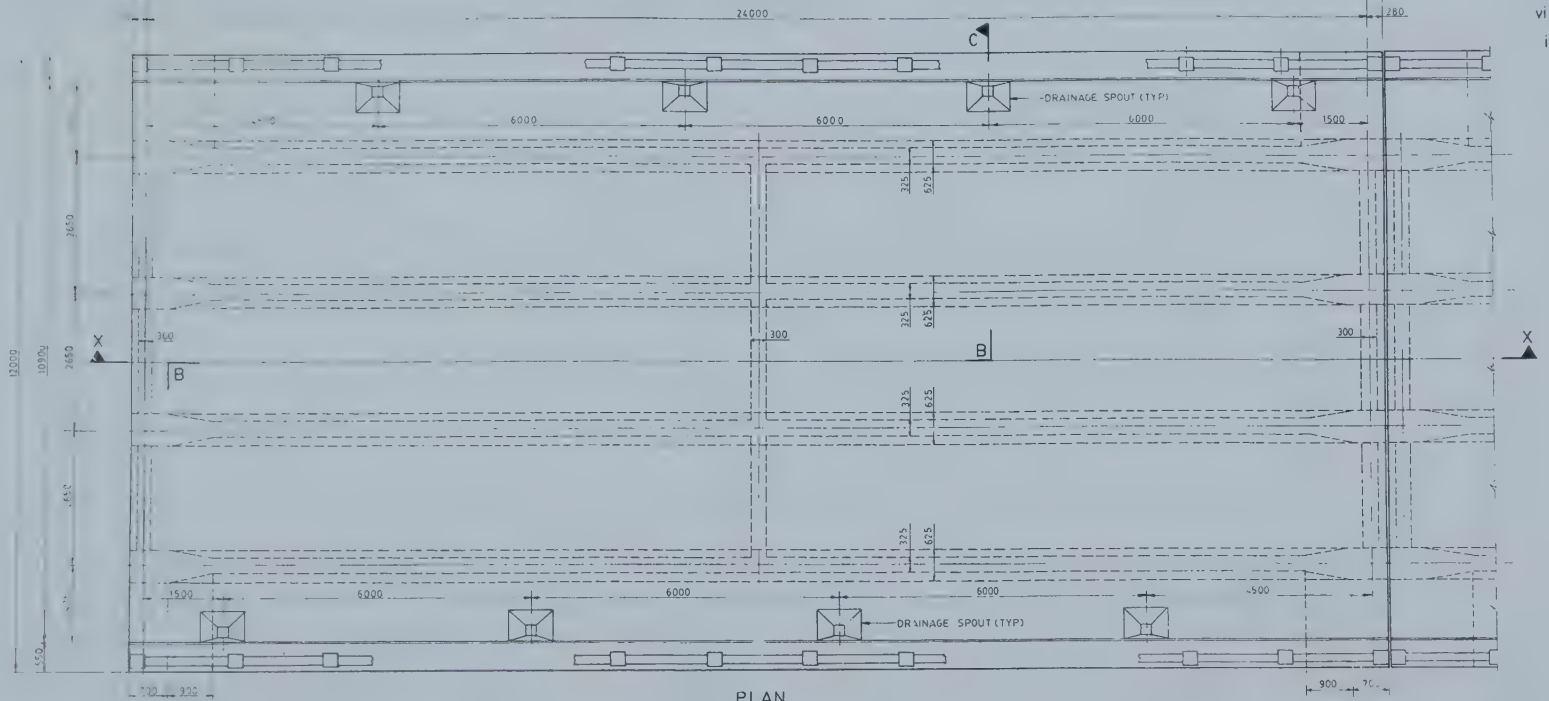
GENERAL NOTES

RECOMMENDED BY		APPROVED BY	1990
(M.P. MARWAH) E.E.	(N. K. SINHA) S.E.	(M. K. MUKHERJEE) C.E.	DRG. NO. SD/200.

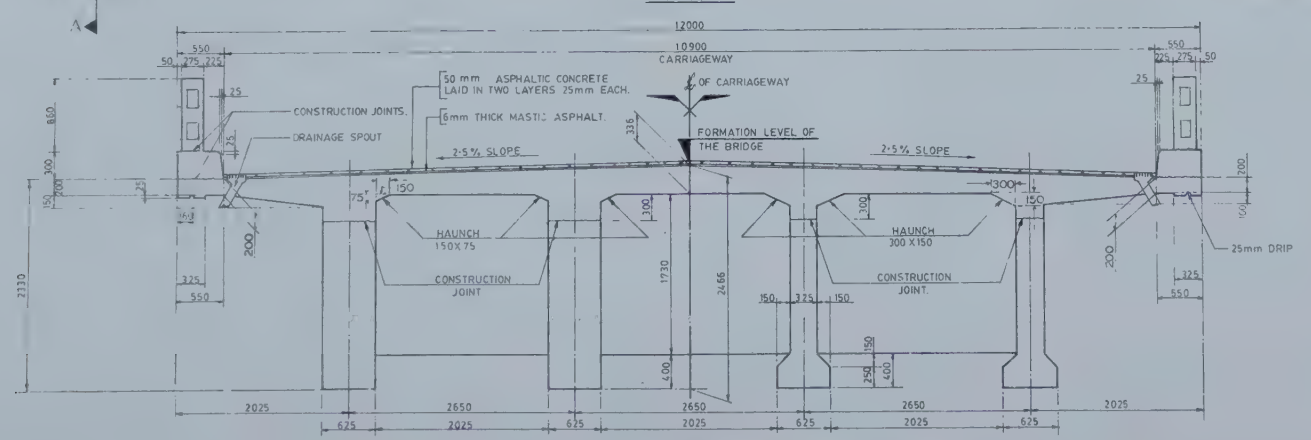
DRG. NO. - SD / 210.



SECTIONAL ELEVATION X X.



PLAN.



SECTION A B C.

NOTES:

This drawing is to be read in conjunction with the following drawings.

i) General notes...Drg. No. SD / 200
ii) Details of R.C.C. railings...Drg. No. SD / 201.
iii) Details of elastomeric bearings...Drg. No SD / 203.
iv) Details of rocker and roller bearings...Drg. No. SD / 204.
v) Details of miscellaneous items...Drg. No. SD / 205.
vi) Details of deck slab (for bridges without footpaths)... Drg. No. SD / 212.
vii) Details of longitudinal girders...Drg. No. SD / 214
viii) Details of cross girders...Drg. No. SD / 215.
ix) Schedule of reinforcement...Drg. No. SD / 216. Sh-1 & Sh-2.

MKD	DATE	DESCRIPTION
		REVISION

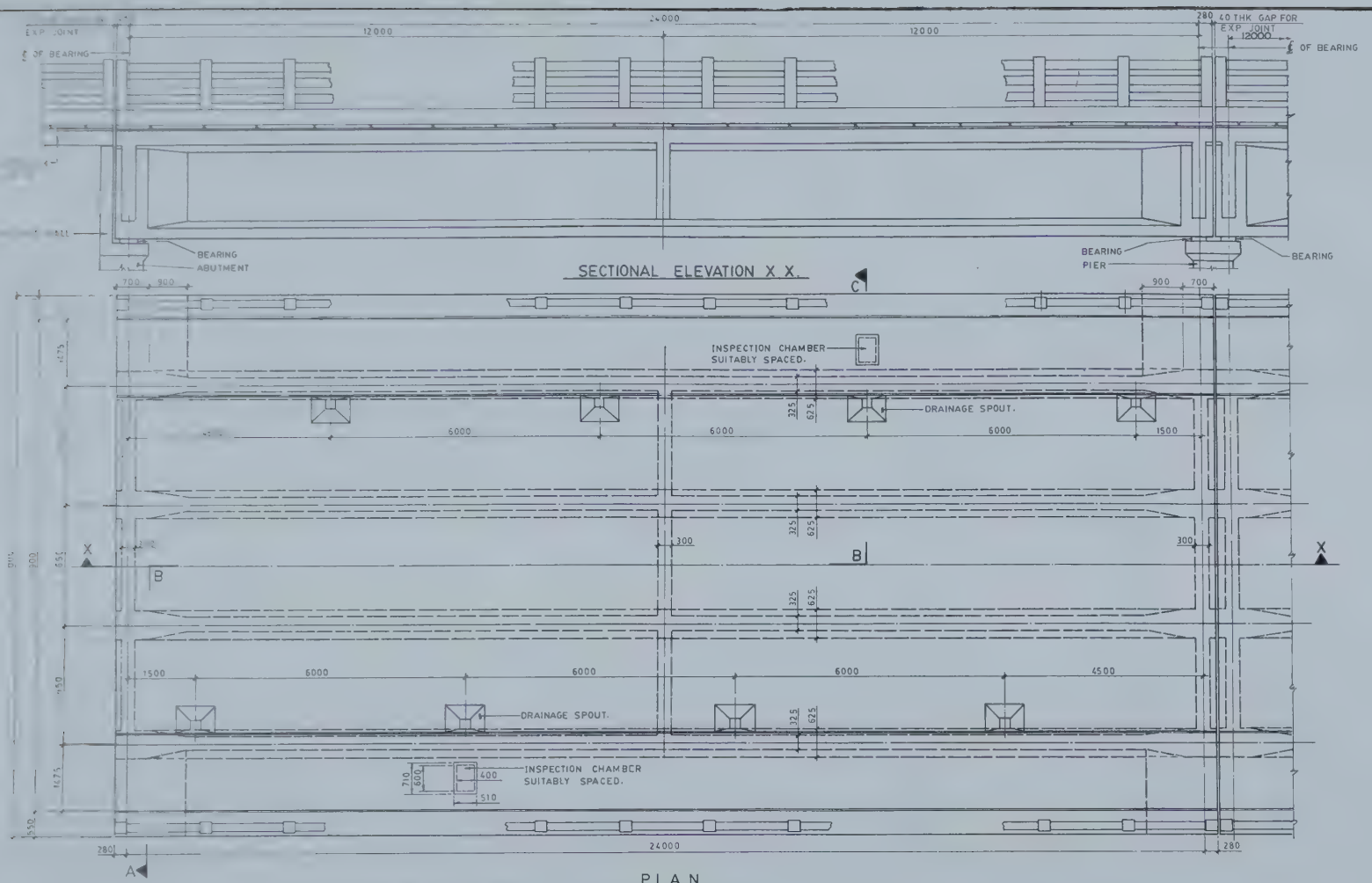
GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
(ROADS WING), NEW DELHI

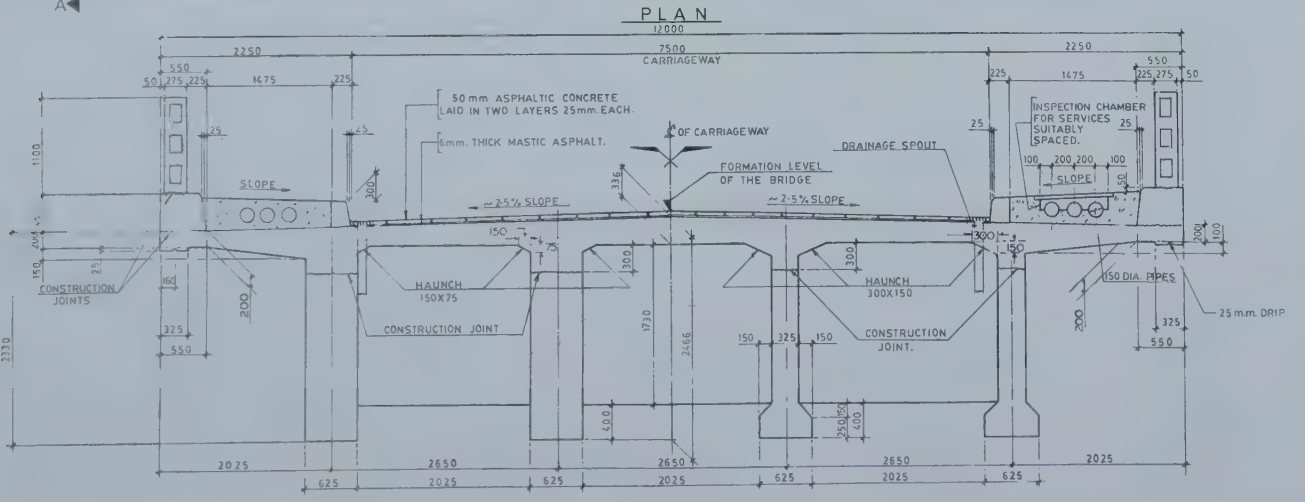
STANDARD DRAWINGS FOR ROAD BRIDGES

R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE
24·0 M. SPAN WITHOUT FOOTPATHS
GENERAL ARRANGEMENT

RECOMMENDED BY		APPROVED BY	
(M P MARWAH) E E	(N K SINHA) S E	(M. K. MUKHERJEE) C.E.	DRG NO SD / 210.

DRG. NO. SD/211





NOTES:

This drawing is to be read in conjunction with the following drawings

i) General notes... Drg. No. SD/200
ii) Details of R.C.C. railings... Drg. No. SD/202.
iii) Details of elastomeric bearings.. Drg. No. SD/203.
iv) Details of rocker and roller bearings.. Drg. No. SD/204.
v) Details of miscellaneous items... Drg. No. SD/205.
vi) Details of deck slab (for bridges with foot paths) ...Drg. No. SD/213.
vii) Details of longitudinal girders... Drg. No. SD/214.
viii) Details of cross girders... Drg. No. SD/215
ix) Schedule of reinforcement... Drg. No. SD/217 Sh.1 & Sh.2

MKD	DATE	DESCRIPTION	BY
		REVISION	

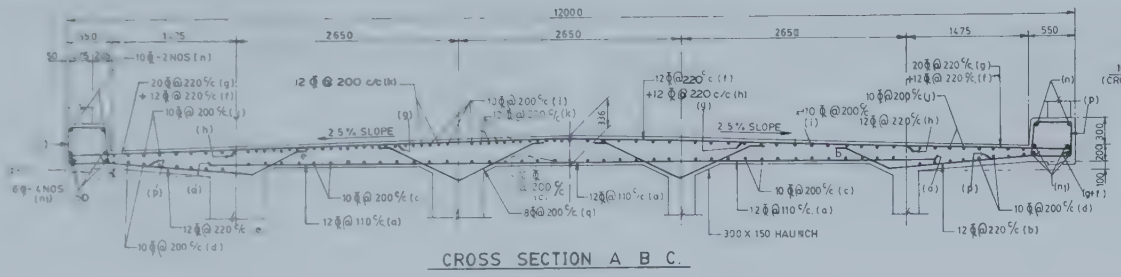
GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
(ROADS WING), NEW DELHI.

STANDARD DRAWINGS FOR ROAD BRIDGES

R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE
24·0 M. SPAN WITH FOOTPATHS
GENERAL ARRANGEMENT

RECOMMENDED BY		APPROVED BY	1990
(M. P. MARWAH) E.E.	(N.K. SINHA) S.E.	(M. K. MUKHERJEE) C.E.	DRG. NO SD/211

DRG. NO. SD/212.

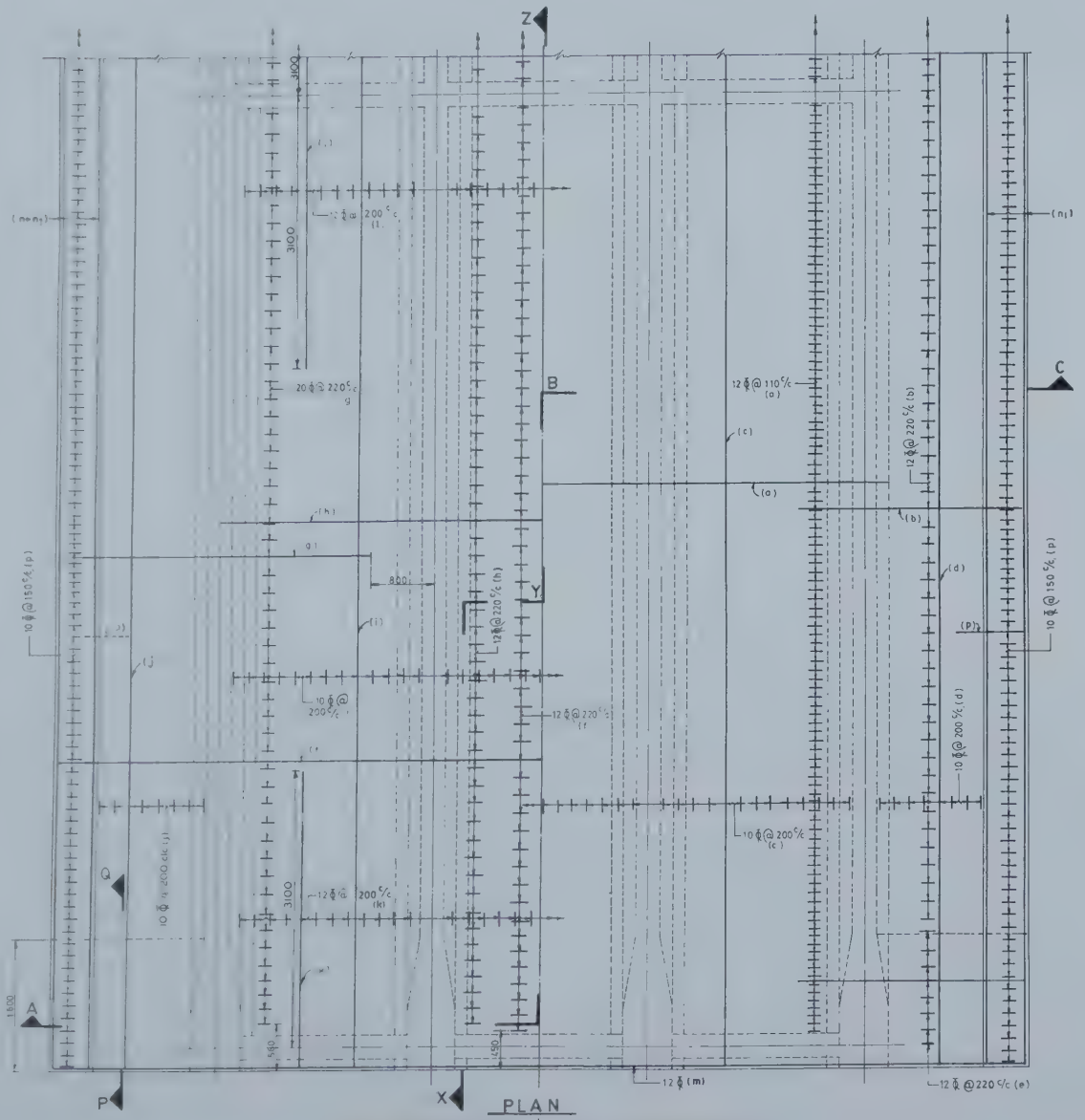


CROSS SECTION A B C.

SECTION P Q.

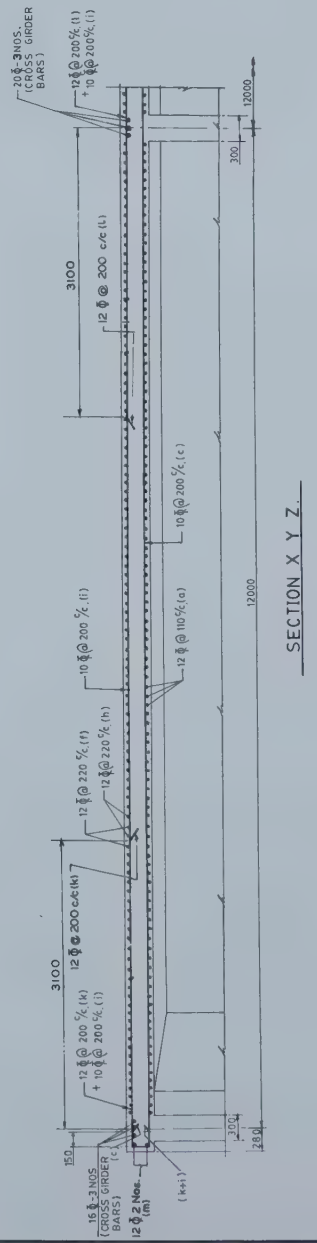
NOTES :-

1. The reinforcement for railing posts should be properly anchored in the deck slab before casting the slab.
2. This drawing is to be read in conjunction with following drgs.
   - i) General notes...Drg. No. SD/200.
   - ii) Details of R.C.C. railing...Drg.No. SD/201.
   - iii) Details of elastomeric bearings...Drg.No. SD/203.
   - iv) Details of rocker and roller bearings...Drg.No.SD/204.
   - v) Details of miscellaneous items..Drg.No. SD/205.
   - vi) General arrangement (for bridges without footpaths) ...Drg.No. SD/210
   - vii) Details of longitudinal girders..Drg.No. SD/214.
   - viii) Details of cross girders..Drg. No. SD/215.
   - ix) Schedule of reinforcement...Drg.No. SD/216. Sh-1 & Sh-2.



PLAN

HALF TOP REINFORCEMENT + HALF BOTTOM REINFORCEMENT



SECTION X Y Z.

MKD	DATE	DESCRIPTION	BY
		REVISION	

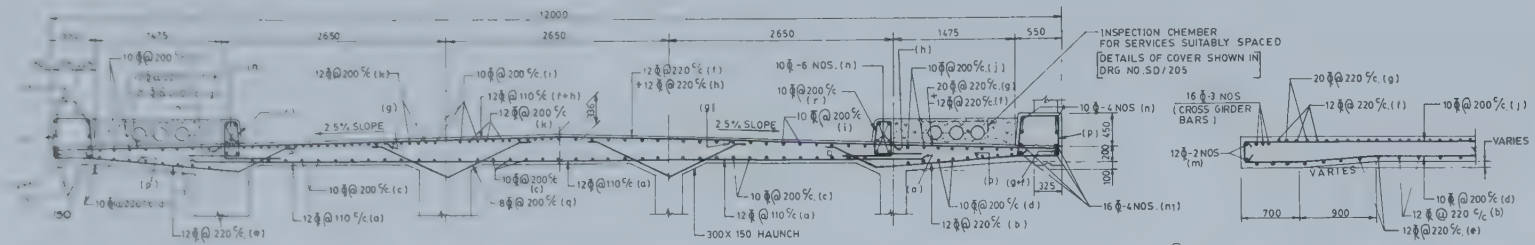
GOVERNMENT OF INDIA.
MINISTRY OF SURFACE TRANSPORT.
(ROADS WING), NEW DELHI.

STANDARD DRAWINGS FOR ROAD BRIDGES.

R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE
24·0 M SPAN WITHOUT FOOTPATHS
DETAILS OF DECK SLAB

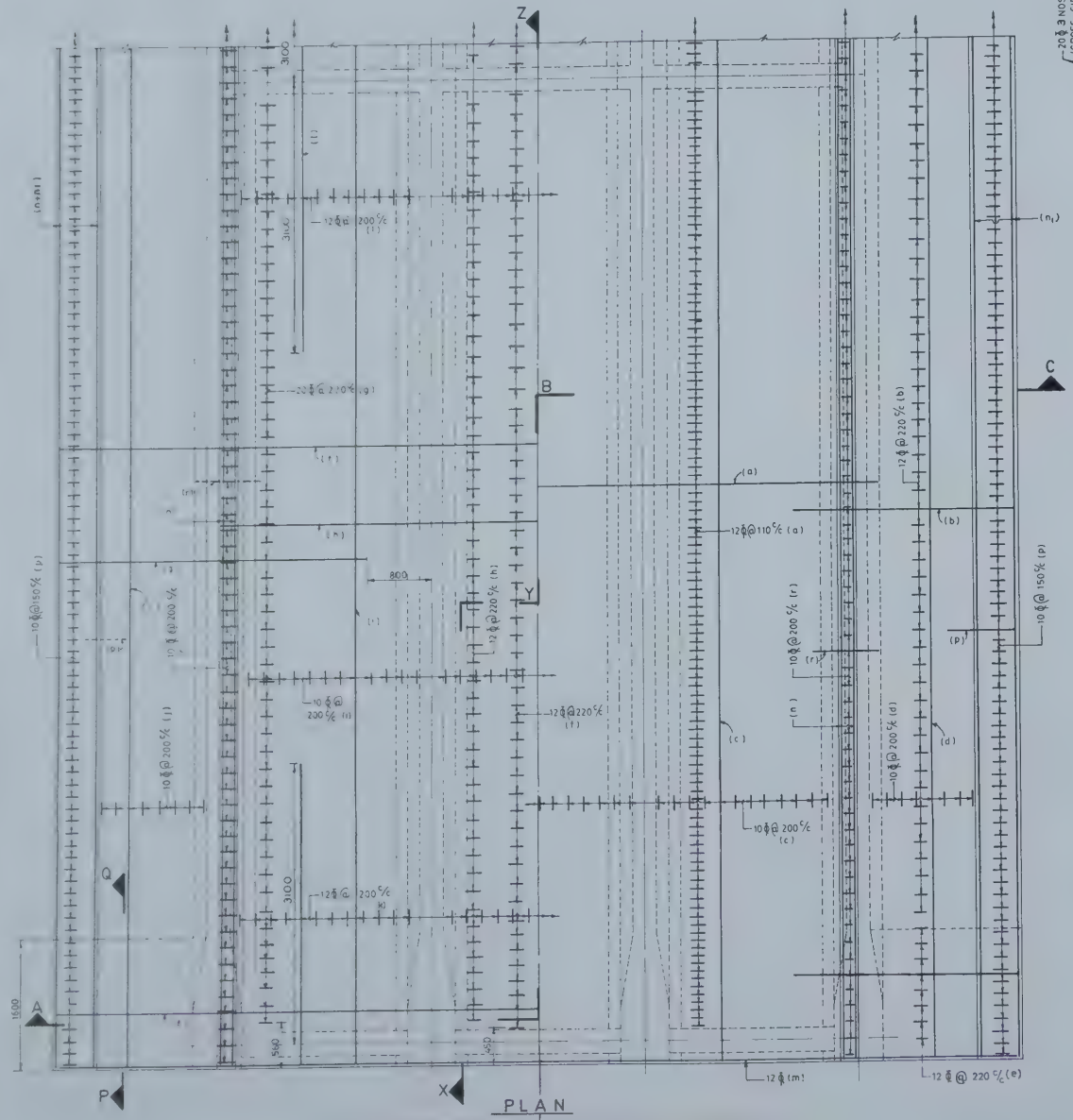
RECOMMENDED BY:		APPROVED BY:	1990
(M. P. MARWAH) E.E	(N. K. SINHA) S.E.	(M. K. MUKHERJEE) C.E.	DRG. NO. SD/212.

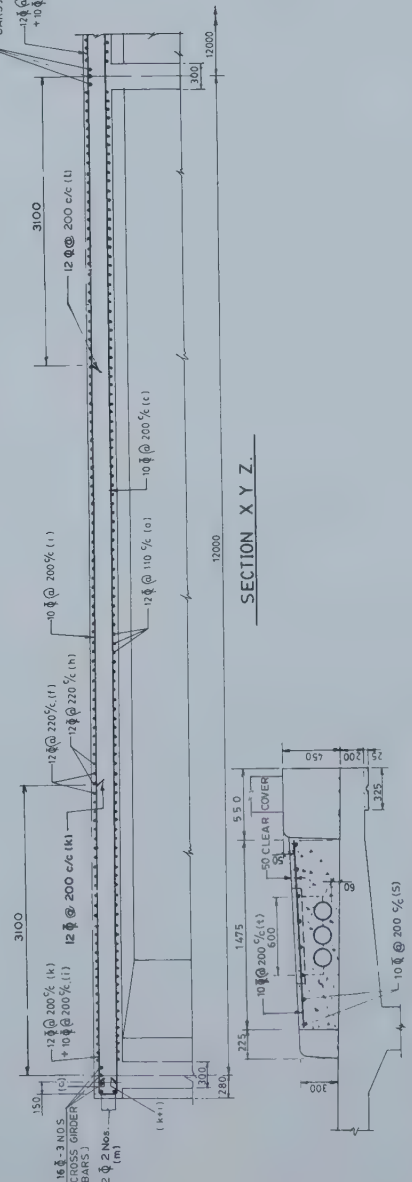
DRG.NO. SD/213.



CROSS SECTION A B C.

SECTION P Q.





SECTION X Y Z.

DETAILS OF REINFORCEMENT IN FOOTPATH.

NOTES :-

1. The reinforcement for railing post should be properly anchored in the deck slab before casting the slab.
2. This drawing is to be read in conjunction with following drgs.
   - i) General notes...Drg.No. SD/200.
   - ii) Details of R.C.C. railing..Drg. No. SD/202.
   - iii) Details of elastomeric bearings...Drg.No. SD/203.
   - iv) Details of rocker and roller bearings...Drg. No. SD/204.
   - v) Details of miscellaneous items...Drg.No. SD/205
   - vi) General arrangement.(for bridges with footpaths)...Drg. No. SD/211.
   - vii) Details of longitudinal girders...Drg.No. SD/214.
   - viii) Details of cross girders...Drg.No. SD/215.
   - ix) Schedule of reinforcement...Drg.No. SD/217. Sh-1 & Sh-2.

MKD	DATE	DESCRIPTION	BY
		REVISION.	

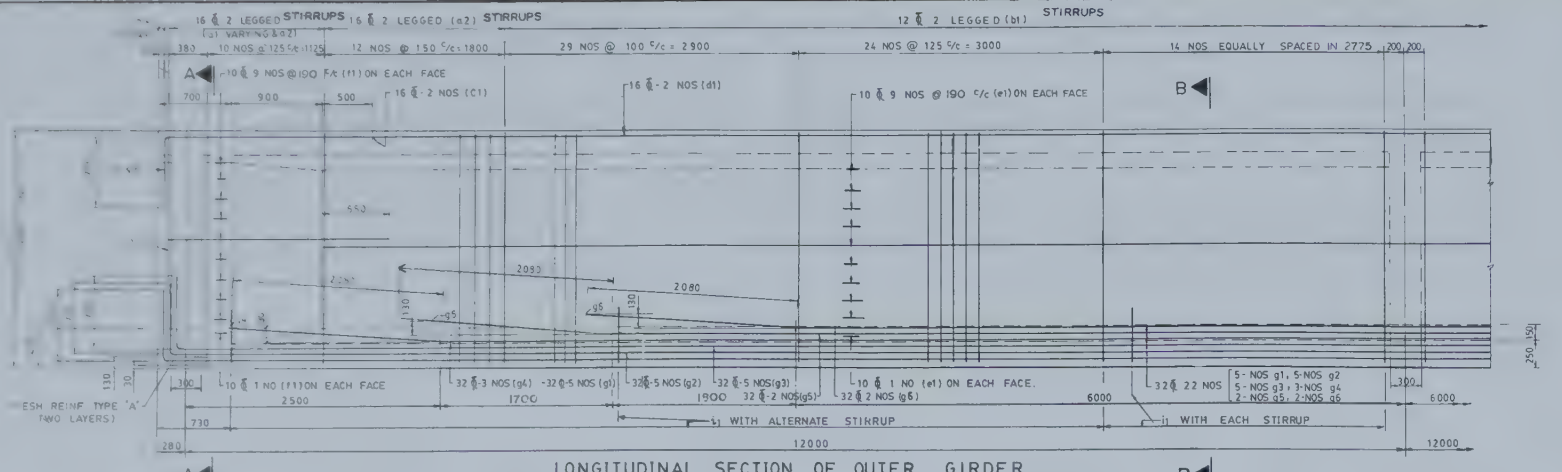
GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
(ROADS WING), NEW DELHI .

STANDARD DRAWINGS FOR ROAD BRIDGES

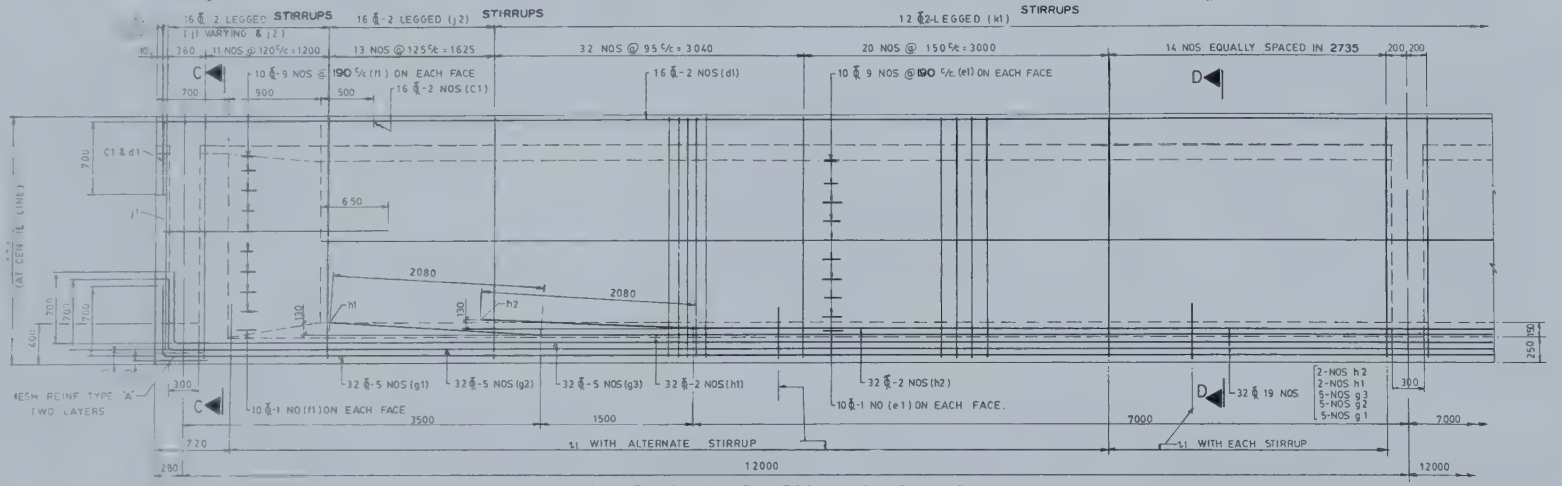
R.C.C T-BEAM AND SLAB SUPERSTRUCTURE 24·0 M. SPAN WITH FOOTPATHS DETAILS OF DECK SLAB.

RECOMMENDED BY		APPROVED BY	1990
(M P MARWAH) EE	(N K SINHA) SE	(M K MUKHERJEE) CE.	DRG NO. SD/213.

DRG. NO. SD/214



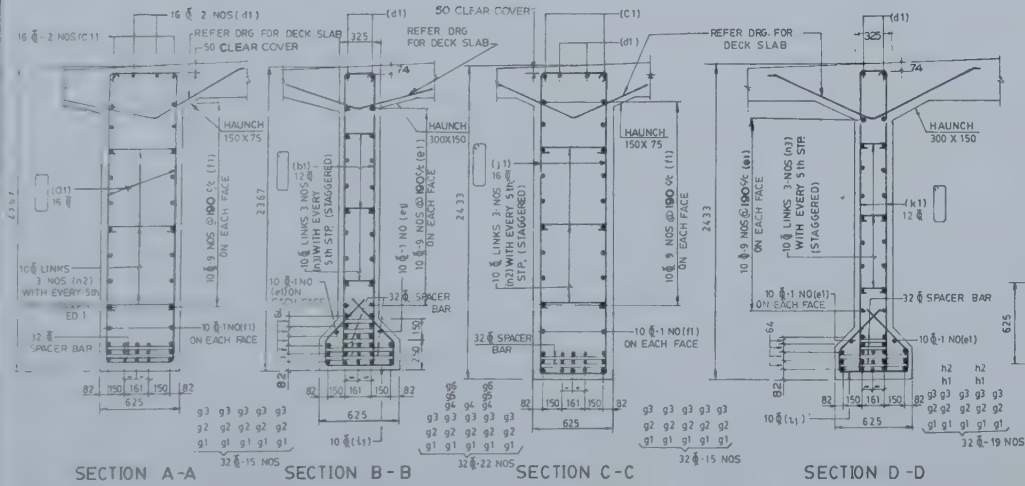
LONGITUDINAL SECTION OF OUTER GIRDER

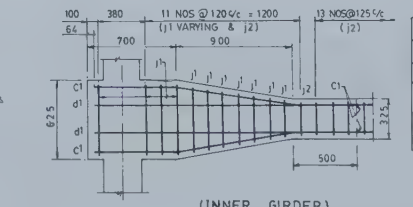


LONGITUDINAL SECTION OF INNER GIRDER

NOTES

1. Longitudinal girders shall be given upward camber on account of dead load deflection as given in the table - I.
2. 32 ϕ spacer bars shall be provided @ 1m c/c between two tiers of longitudinal bars of girders.
3. This drawing shall be read in conjunction with the following drgs.
   - i) General notes - Drg. No. SD/200.
   - ii) Details of elastomeric bearing - Drg. No. SD/203.
   - iii) Details of rocker and roller bearing - Drg. No. SD/204.
   - iv) General arrangement (for bridges without footpaths) - Drg. No. SD/210.
   - v) General arrangement (for bridges with footpaths) Drg. No. SD/211.
   - vi) Details of deck slab (for bridges without footpaths) - Drg. No. SD/212.
   - vii) Details of deck slab (for bridges with footpaths) Drg. No. SD/213.
   - viii) Details of cross girders - Drg. No. SD/215.
   - ix) Schedule of reinforcement (for bridges without footpaths) - Drg. No. SD/216. Sh-1 & Sh-2.
   - x) Schedule of reinforcement (for bridges with footpaths) - Drg. No. SD/217. Sh-1 & Sh-2.

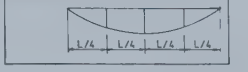

16 ϕ 2 NOS (d1)
16 ϕ-2 NOS (C1)
REFER DRG FOR DECK SLAB
50 CLEAR COVER
HAUNCH 150 X 75
HAUNCH 300X150
HAUNCH 300 X 150
10 ϕ 9 NOS @ 190 c/c (f1) ON EACH FACE
10 ϕ 9 NOS @ 190 c/c (e1) ON EACH FACE
10 ϕ LINKS 3 NOS (n2) WITH EVERY 5th STP. (STAGGERED)
10 ϕ-1 NO (e1) ON EACH FACE
10 ϕ-1 NO(f1) ON EACH FACE
32 ϕ SPACER BAR
32 ϕ-15 NOS
32 ϕ-22 NOS
32 ϕ-19 NOS
SECTION A-A
SECTION B-B
SECTION C-C
SECTION D-D



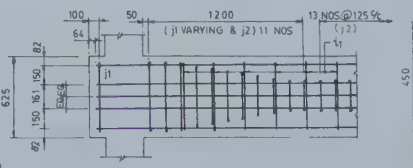
(INNER GIRDER)
PLAN SHOWING WEB REINF (TOP) AT THE END

TABLE - I

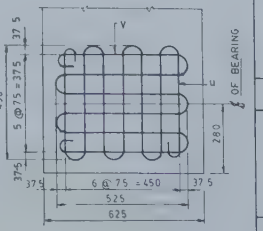
	1/4 POINT	MID SPAN	1/4 POINT
BRIDGE WITH F.P.	12 m m	18 m m	12 m m
BR. WITH-OUT F.P.	11 m m	16 m m	11 m m



DEAD LOAD DEFLECTION DIAGRAM



(INNER GIRDER)
PLAN SHOWING BULB REINF. AT THE END.
(SIMILAR SCHEME OF DETAILING WILL BE FOLLOWED FOR OUTER GIRDERS)



8 ϕ MESH REINFORCEMENT TYPE - 'A'

MKD	DATE	DESCRIPTION	BY
		REVISION	

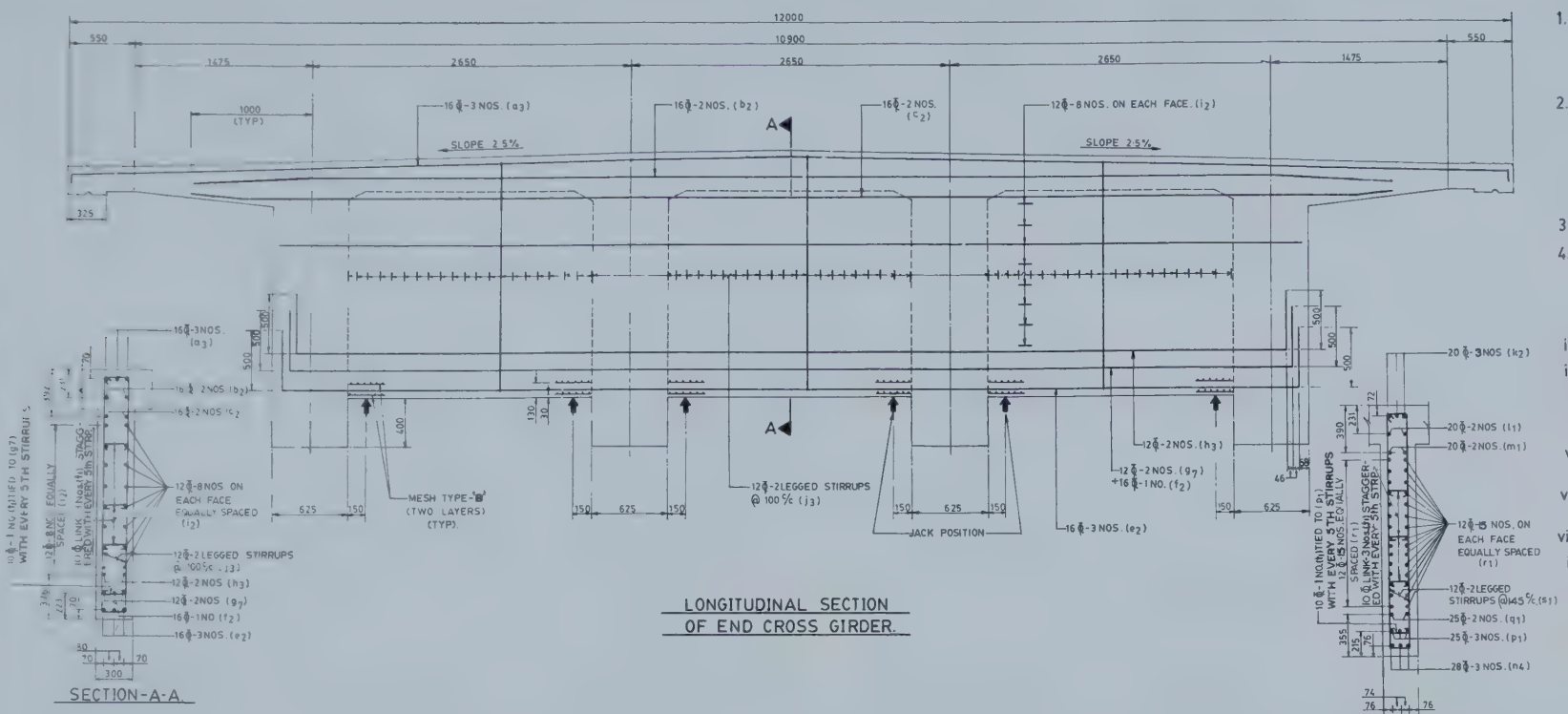
GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
(ROADS WING), NEW DELHI

STANDARD DRAWINGS FOR ROAD BRIDGES

R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE
24·0 M. SPAN WITH & WITHOUT FOOTPATHS
DETAILS OF LONGITUDINAL GIRDERS

RECOMMENDED BY		APPROVED BY	1990
(M P MARWAH) E.E.	(N K SINHA) S.E.	(M.K. MUKHERJEE) C.E.	DRG NO SD/214.

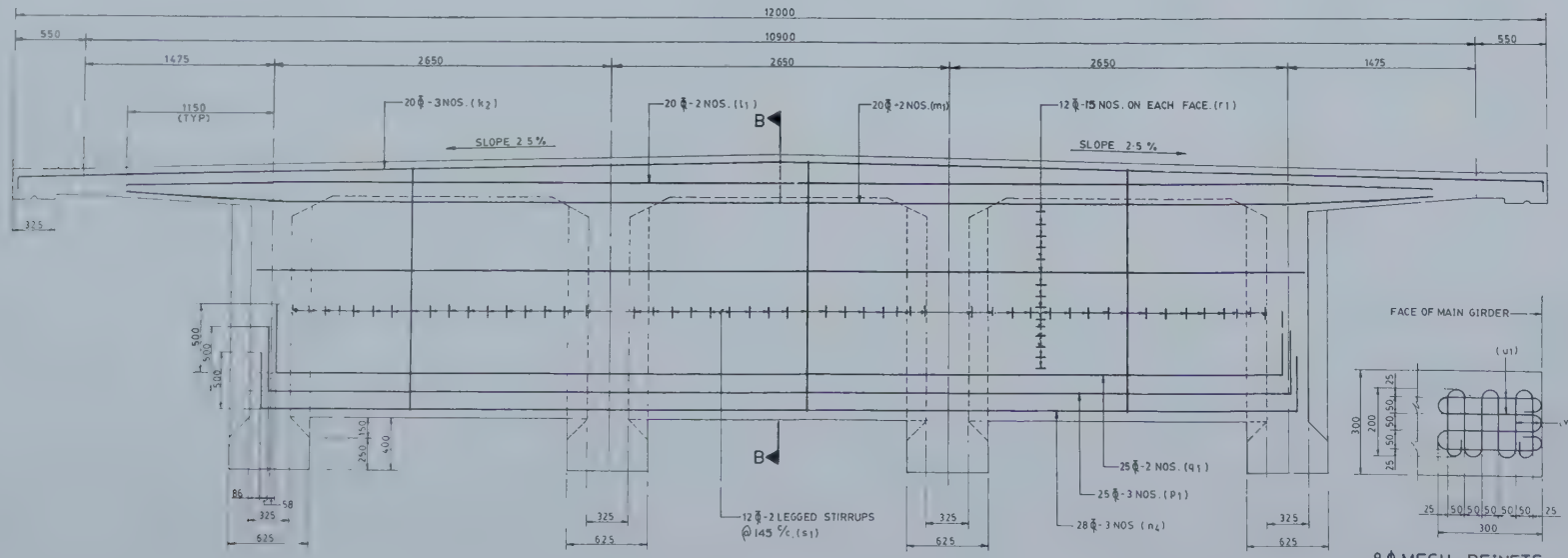
DRG.NO. SD/215.



LONGITUDINAL SECTION OF END CROSS GIRDER.

NOTES:

1. The location of jacks for lifting of the superstructure to replace bearings etc. is shown thus ⬆. This shall be distinctly etched for easy identification on the end cross girders and pier/abutment caps.
2. During the lifting operation, all the six jacks placed under the end cross-girder in line with the bearings shall be operated simultaneously using single operating console, grouping the pump and control system, so as to ensure that the reactions on all the six jacks are equal at all times.
3. Capacity of each jack shall not be less than 48 T
4. This drawing shall be read in conjunction with the following drawings.
   - i) General notes...Drg.No. SD/200.
   - ii) Details of elastomeric bearings...Drg.No. SD/203
   - iii) Details of rocker and roller bearings...Drg.No. SD/204.
   - iv) General arrangement.(for bridges without footpaths) ...Drg.No. SD/210.
   - v) General arrangement.(for bridges with footpaths).. Drg.No. SD/211.
   - vi) Details of deck slab.(for bridges without footpaths) ...Drg.No. SD/212.
   - vii) Details of deck slab.(for bridges with footpaths).. Drg.No. SD/213
   - viii) Details of longitudinal girders...Drg.No. SD/214
   - ix) Schedule of reinforcement (for bridges without footpaths) Drg.No. SD/216. Sh-1 & Sh-2
   - x) Schedule of reinforcement. (for bridges with-footpaths)...Drg.No. SD/217. Sh-1 & Sh-2



LONGITUDINAL SECTION OF INTERMEDIATE CROSS GIRDER.

MKD	DATE	DESCRIPTION	BY
		REVISION	

GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
(ROADS WING), NEW DELHI.

STANDARD DRAWINGS FOR ROAD BRIDGES

R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE 24·0 M. SPAN WITH & WITHOUT FOOTPATHS DETAILS OF CROSS GIRDERS

RECOMMENDED BY		APPROVED BY	1990
(M.G. MARWAH) EE	(N.K. SINHA) SE	(M.K. MUKHERJEE) CE	DRG. NO. SD/215.

DRG. NO. SD/216 Sh-1

SCHEDULE OF REINFORCEMENT (PER SPAN)

A HYSD BARS

Sl No	Type of bars	Shape of bars (not to scale) (dimensions are in millimetres)	Dia of bars (mm)	Length of each bar (mm)	No of bars	Total length (m)	Weight (Kg)
		Slab					
	a	8575	12	8575	214	1835·05	1651·55
	b	249, 530, R=120, 1692, 500, 140, 137, R=120	12	2976	190	565·44	508·90
		150, L, 150, L, 24460, L=varying from 109 to 212	10	24960	39	973·44	584·06
	d	150, 21360, R=100, 140, 901, varying from 68 to 70, 852, R=120, varying from 68 to 70, 650	10	24960	16	399·36	239·62
5	e	varying from 150 to 530, R=120, varying from 1543 to 1692, 500, 140, varying from 249 to 313, R=120, varying from 137 to 198	12	2987	32	95·58	86·02
6	f	75, 5952, R=120, 5952, 75, 149	12	12054	108	1301·83	1171·65
7	g	120, 3826, 75, 96	20	3946	212	836·55	2091·38
8	h	3976, R=120, 3976, 99	12	7952	106	842·91	758·62
9	i	24460, L, 150, L, 150, L=varying from 109 to 212	10	24960	39	973·44	584·06
10	j	24460, L, 75, 75, L, L=varying from 68 to 270	10	24888	16	398·21	238·93
11	k	3330, L, 170, L=varying from 109 to 212	12	3588	72	258.34	232.50
12	l	6200	12	6200	36	223.20	200.88
13	m	11900	12	11900	4	47·60	42·84
14	n	24460	10	24460	4	97·84	58·70
15	n_3	24460	16	24460	8	195·68	313·09
16	p	40, 80, 380, 243, 570, varying from 37 to 54	10	2208	328	724·22	434·53
17	q	193, 150, R=80, 960, 950, R 80, 433	8	2110	236	497·96	199·18
		Longitudinal girders					
1	a_1	L1=varying from 2237 to 2241, L1, L2, L2=varying from 2229 to 2233, varying from 193 to 493	16	5476	44	240·94	385·51
	a_2	2233, 2237, 33	16	5176	48	248·45	397·52
3	b_1	2333, 2237, 33	12	5096	268	1365·73	1229·16
4	c_1	708, R=96, 166, 536, 913, 500, Elevation, Plan	16	2693	16	43·09	68·94
5	d_1	24432, 708, R=96, 708	16	25720	8	205·76	329·22
	e	21360	10	21360	80	1708·80	1025·28
	f	160, 536, 913, 650	10	2199	160	351·84	211·10
8	g_1	716, R=192, 716, 24432	32	25608	20	512·16	3226·61
9	j_1	716, R=192, 716, 24304	32	25480	20	509·60	3210·48

Sl NO	Type of bars	Shape of bars (not to scale) (dimensions are in millimetres)	Dia of bars (mm)	Length of each bar (mm)	No of bars	Total length (m)	Weight (Kg)
10	g_3	716, R=192, 716, 24176	32	25352	20	507·04	3194·35
11	g_4	2080, 19000, 2080, 162	32	23160	6	138·96	875·45
12	g_5	2080, 15600, 2080, 162	32	19760	4	79·04	497·95
13	g_6	2080, 12000, 2080, 162	32	16160	4	64·64	407·23
14	h_1	2080, 17000, 2080, 162	32	21160	4	84·64	533·23
15	h_2	2080, 14000, 2080, 162	32	18160	4	72·64	457·63
16	i_1	150, 450, 493, 315, 485	10	1733	408	708·06	424·24
17	j_1	L1=varying from 2303 to 2307, L1, L2, L2= varying from 2295 to 2299 varying from 193 to 493	16	5608	48	269·18	430·69
18	j_2	2299, 2303, 193	16	5308	52	276·02	441·63
19	k_1	2303, 2299, 193	12	5228	264	1380·19	1242·17
20	n_2	140, L, 140, L=varying from 213 to 513	10	583	72	41·98	25·19
21	n_3	140, 213, 140	10	433	384	166·27	99·76

B) M. S. BARS(MESH REINFORCEMENT IN LONGITUDINAL GIRDERS)

MESH IN GIRDERS	1	u	25, 375, 30, 375, 375, 375, 30, 375, 25, 75, 75, 75, 75, 75, 75	8	3550	16	56·80	22·72
	2	v	25, 30, 75, 75, 75, 75, 30, 25, 37·5, 450, 25	8	3506	16	56·10	22·44

NOTES

1 Dimensions in the schedule are given as per IS: 2502 -1963

2 The exact length of the bars will be determined by the actual laps with splices adopted at site.

3 This drawing shall be read in conjunction with following drawings.

i) General notes Drg.No. SD/200.

ii) Details of deck slab (for bridges without footpath) Drg.No. SD/212.

iii) Details of longitudinal girders Drg. No. SD/214.

MKD	DATE	DESCRIPTION	R.
		REVISION	

GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
(ROADS WING), NEW DELHI

STANDARD DRAWINGS FOR ROAD BRIDGES

R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE
24·0 M SPAN WITHOUT FOOTPATHS
SCHEDULE OF REINFORCEMENT

RECOMMENDED BY		APPROVED BY	1990
(M. P. MARWAH) E.E.	(N. K. SINHA) S.E.	(M. K. MUKHERJEE) C.E.	DRG. NO. SD/216 Sh-1

DRG. NO SD/216 Sh-2

SCHEDULE OF REINFORCEMENT (PER SPAN)

A) HYSD BARS

	Type of bars	Shape of bars (not to scale) (dimensions are in millimetres)	Dia of bars (mm)	Length of each bar (mm)	No of bars	Total length (m)	Weight (kg)
		CROSS GIRDERS					
1	a_3	5952 5952 152	16	12094	6	72·56	116·10
2	b_2	1000 7950 1000 41	16	9950	4	39·80	63·68
3	c_2	R=160, 412 9132 412, 64	16	9956	4	39·82	63·71
4	e_2	R=64, 508, 8475, 508	16	9395	6	56·37	90·19
5	f_2	R=64, 508, 8383, 508	16	9303	2	18·61	29·78
6	g_7	R=48, 506, 8379, 506	12	9319	4	37·28	33·55
7	h_3	R=48, 506, 8287, 506	12	9227	4	36·91	33·22
8	i_2	R=48, 233, 8443, 233	12	8837	32	282·78	254·50
9	j_3	Varying from 1852 to 1942, 176	12	4386	126	552·64	497·38
10	k_2	5952 5952 156	20	12144	3	36·43	91·08
11	l_1	1150 7950 1150 50	20	10250	2	20·50	51·25
12	m_1	1175 7908 1175 110	20	10258	2	20·52	51·30
13	n_4	R=168, 514, 8131, 514	28	8334	3	26·80	128·64
[illegible]	[illegible]	R=100, 512, 8012, 512	25	8886	3	26·66	101·31
[illegible]	[illegible]	R=100, 512, 7896, 512	25	8770	2	17·54	66·65
[illegible]	[illegible]	R=48, 529, 8151, 529	12	9137	30	274·11	246·70
17	s_1	Varying from 1848 to 1942, 176	12	4382	51	223·48	201·13
18	t_1	140, 196, 140	10	416	168	69·89	41·93

B) M.S. BARS (MESH REINFORCEMENT IN CROSS GIRDERS)

19	u_1	30, 30, 5@50=250, 25	8	1453	24	34·87	13·95
20	v_1	30, 30, 30, 150, 25, 25, 5@50=250	8	1510	24	36·24	14·50

d = Dia of bar
For bar upto 25 mm. dia — R=4d

d = Dia of bar
For bar above 25 mm. dia — R=6d

MAXIMUM DEAD LOAD REACTIONS (in KN)

At Abutment	At Pier
2554	5108

TOTAL QUANTITY* (PER SPAN)

1. STEEL ... HYSD BARS = 31·79 T
   ... MS BARS = 0·08 T
   (including 5% extra for laps and wastage)
2. CONCRETE ... = 184·30 M³

* Excluding quantities for railing.

NOTES

1. Dimensions in the schedule are given as per IS:2502-1963.
2. The exact length of the bars will be determined by the actual laps/splices adopted at site.
3. This drawing shall be read in conjunction with following drawings.
   i) General notes Drg. No. SD/200.
   ii) Details of cross girders Drg. No. SD/215.
   iii) Schedule of reinforcement Drg. No. SD/216 Sh-1.

MKD	DATE	DESCRIPTION	SI.
		REVISION	

GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
(ROADS WING), NEW DELHI

STANDARD DRAWINGS FOR ROAD BRIDGES

R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE 24·0 M SPAN WITHOUT FOOTPATHS SCHEDULE OF REINFORCEMENT

RECOMMENDED BY :		APPROVED BY :	1990
(M P. MARWAH) E E	(N.K SINHA) S E	(M. K. MUKHERJEE) C.E.	DRG NO SD/216 - Sh-2

DRG.NO. SD/217 Sh 1

SCHEDULE OF REINFORCEMENT (PER SPAN)

A) H.Y.S.D. BARS.

Sl. No.	Type of bars	Shape of bars (not to scale) (dimensions are in millimetres)	Dia of bars (mm)	Length of each bar (mm)	No of bars.	Total length (m.)	Weight (kg)
		Slab / Footpath					
1	a	8575	12	8575	214	1835·05	1651·55
2	b	150, 530, R=120, 1692, 530, R=120, 140, 249, 371	12	2976	190	565·44	508·90
3	c	150, 150, L, 24460, L= Varying from 109 to 212.	10	24960	37	923·52	554·11
4	d	140, 21360, R=100, 140, 901, 901, Varying from 0 to 70, 650, R=100, 650, L= Varying from 68 to 270	10	24960	16	399·36	239·62
5	e	Varying from 249 to 313, 150, Varying from 530 to 700, R=120, Varying from 1543 to 1692, R=120, 500, Varying from 137 to 198, 140	12	2987	32	95·58	86·02
6	f	5952, 5952, R=120, 75, 75, 149	12	12054	108	1301·83	1171·65
7	g	3826, 120, 96	20	3946	212	836·55	2091·38
8	h	3976, 3976, R=120, 99	12	7952	106	842·91	758·62
9	i	24460, L, 150, 150, L= Varying from 109 to 212	10	24960	37	923·52	554·11
10	j	24460, L, 75, 75, L= Varying from 68 to 270	10	24888	16	398·21	238·93
11	k	3330, L, 170, L= Varying from 109 to 212.	12	3588	72	258·34	232·50
12	l	6200	12	6200	36	223·20	200·88
13	m	11900	12	11900	4	47·60	42·84
14	n	24460	10	24460	20	489·20	293·52
15	n_1	24460	16	24460	8	195·68	313·09
16	p	405, 530, 530, 438, 500, Varying from 37 to 54	10	2503	328	820·98	492·59
17	q	150, 393, 860, R=80, 950, 150, R=80, 433	8	2110	236	497·96	199·18
18	r	80, 390, 390, 500, 500	10	1860	246	457·56	274·54
19	s	24460	10	24460	16	391·36	234·82
20	t	1400	10	1400	246	344·40	206·64
		Longitudinal girders.					
1	a_1	L_1= Varying from 2237 to 2241. L_2= Varying from 2229 to 2233. Varying from 193 to 493	16	5476	44	240·94	385·51
2	a_2	2233, 193, 2237	16	5176	48	248·45	397·52
3	b_1	2233, 193, 2237	12	5096	268	1365·73	1229·16
4	c_1	708, R=96, Elevation. 636, 166, 913, 500, Plan.	16	2693	16	43·09	68·94
5	d_1	24432, 708, R=96, 708	16	25720	8	205·76	329·22

Sl. No.	Type of bars	Shape of bars (not to scale) (dimensions are in millimetres)	Dia of bars (mm.)	Length of each bar (m.m)	No of bars.	Total length (m.)	Weight (kg.)
6	e_1	21360	10	21360	80	1708·80	1025·28
7	f_1	636, 913, 650, 160	10	2199	160	351·84	211·10
8	g_1	716, R=192, 716, 24432	32	25608	20	512·16	3226·61
9	g_2	716, R=192, 716, 24304	32	25480	20	509·60	3210·48
10	g_3	716, R=192, 716, 24176	32	25352	20	507·04	3194·35
11	g_4	2080, 19000, 2080, 162	32	23160	6	138·96	875·45
12	g_5	2080, 15600, 2080, 162	32	19760	4	79.04	497.95
13	g_6	2080, 12000, 2080, 162	32	16160	4	64·64	407·23
14	h_1	2080, 17000, 2080, 162	32	21160	4	84·64	533·23
15	h_2	2080, 14000, 2080, 162	32	18160	4	72·64	457·63
16	i_1	450, 450, 315, 485, 493	10	1733	408	707·06	424·24
17	j_1	L_1= Varying from 2303 to 2307. L_2= Varying from 2295 to 2299. Varying from 193 to 493	16	5608	48	269·18	430·69
18	j_2	2299, 193, 2303	16	5308	52	276·02	441·63
19	k_1	2299, 193, 2303	12	5228	264	1380·19	1242·17
20	n_2	140, L, 140, L= Varying from 213 to 513.	10	583	72	41·98	25·19
21	n_3	140, 213, 140	10	433	384	166·27	99·76

B) M.S. BARS. (MESH REINFORCEMENT IN LONGITUDINAL GIRDERS)

1	u	25, 375, 375, 30, 30, 375, 375, 25, 75, 75, 75, 75, 75, 75	8	3550	16	56·80	22·72
2	v	30, 30, 30, 75, 75, 75, 75, 75, 37·5, 450, 25	8	3506	16	56·10	22·44

NOTES -

1. Dimensions in the schedule are given as per IS : 2502 – 1963.
2. The exact length of the bars will be determined by the actual laps with splices adopted at site.
3. This drawing shall be read in conjunction with following drawings :

i) General notes... Drg.No. SD/ 200.

ii) Details of deck slab. (for bridges with foot paths)... Drg.No. SD/ 213.

iii) Details of longitudinal girders.. Drg.No. SD/ 214

MKD	DATE	DESCRIPTION	BY
		REVISION	

GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
(ROADS WING), NEW DELHI.

STANDARD DRAWINGS FOR ROAD BRIDGES.

R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE 24·0 M SPAN WITH FOOTPATHS SCHEDULE OF REINFORCEMENT

RECOMMENDED BY.		APPROVED BY	1990
(M.P MARWAH). E E	(N.K SINHA). S.E	(M. K. MUKHERJEE) C.E.	DRG.NO. SD/ 217 Sh 1.

DRG. NO. SD/217 Sh-2

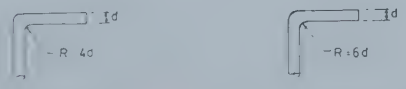
SCHEDULE OF REINFORCEMENT (PER SPAN)

A) HYSD BARS

Sl No	Type of bars	Shape of bars (not to scale) (dimensions are in millimetres)	Dia of bars (mm)	Length of each bar (mm)	No of bars	Total length (m)	Weight (kg)
		CROSS GIRDERS					
1	a_3	5952 / 5952 / 95 / 195 / 152	16	12094	6	72·56	116·10
2	b_2	1000 / 7950 / 1000 / 41	16	9950	4	39·80	63·68
3	c_2	R=160 / 412 / 9132 / 412 / 64	16	9956	4	39·82	63·71
4	e_2	R=64 / 508 / 8475 / 508	16	9395	6	56·37	90·19
5	f_2	R=64 / 508 / 8383 / 508	16	9303	2	18·61	29·78
6	g_7	R=48 / 506 / 8379 / 506	12	9319	4	37·28	33·55
7	h_3	R=48 / 506 / 8287 / 506	12	9227	4	36·91	33·22
8	i_2	233 / R=48 / 8443 / 233	12	8837	32	282·78	254·50
9	j_3	Varying from 1852 to 1942 / 176	12	4386	126	552·64	497·38
10	k_2	5952 / 5952 / 120 / 120 / 56	20	12144	3	36·43	91·08
11	l_1	1150 / 7950 / 1150 / 50	20	10250	2	20·50	51·25
12	m_1	1175 / 7908 / 1175 / 110	20	10258	2	20·52	51·30
13	n_4	514 / R=168 / 8131 / 514	28	8934	3	26·80	128·64
14	p_1	512 / R=100 / 8012 / 512	25	8886	3	26·66	101·31
15	q_1	512 / R=100 / 7896 / 512	25	8770	2	17·54	66·65
16	r_1	529 / R=48 / 8151 / 529	12	9137	30	274·11	246·70
17	s_1	Varying from 1848 to 1942 / 176	12	4382	51	223·48	201·13
18	t_1	140 / 196 / 140	10	416	168	69·89	41·93

B) M S BARS (MESH REINFORCEMENT IN CROSS GIRDERS)

19	u_1	30 / 30 / 50 50 / 25 / 250 / 25	8	1453	24	34·87	13·95
20	v_1	30 / 30 / 25 / 150 / 25 / 50 50 50 50 50	8	1510	24	36·24	14·50



d = Dia of bar
For bar upto 25 mm. dia

d = Dia of bar
For bar above 25 mm. dia

MAXIMUM DEAD LOAD REACTION (in KN)

At Abutment	At Pier
2868	5736

TOTAL QUANTITY* (PER SPAN)

1. STEEL ... ... HYSD BARS = 32·78 T
   MS BARS = 0·08 T
   (including 5% extra for laps and wastage)
2. CONCRETE ... ... = 214·45 M³

* Excluding quantities for railing

NOTES

1. Dimensions in the schedule are given as per IS: 2502-1963.
2. The exact length of the bars will be determined by the actual laps/splices adopted at site
3. This drawing shall be read in conjunction with following drawings
   i) General notes-Drg. No. SD/200
   ii) Details of cross girders-Drg. No. SD/215
   iii) Schedule of reinforcement-Drg. No. SD/217 Sh-1

MKD	DATE	DESCRIPTION	BY
		REVISION	

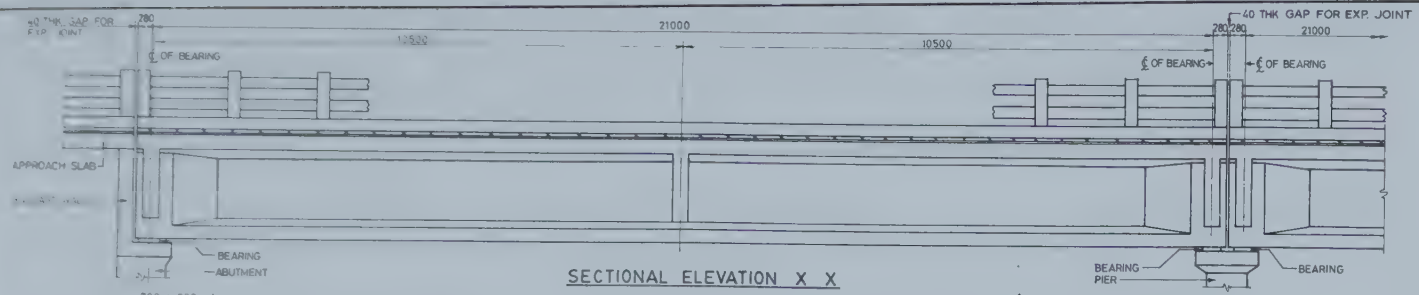
GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
(ROADS WING), NEW DELHI.

STANDARD DRAWINGS FOR ROAD BRIDGES

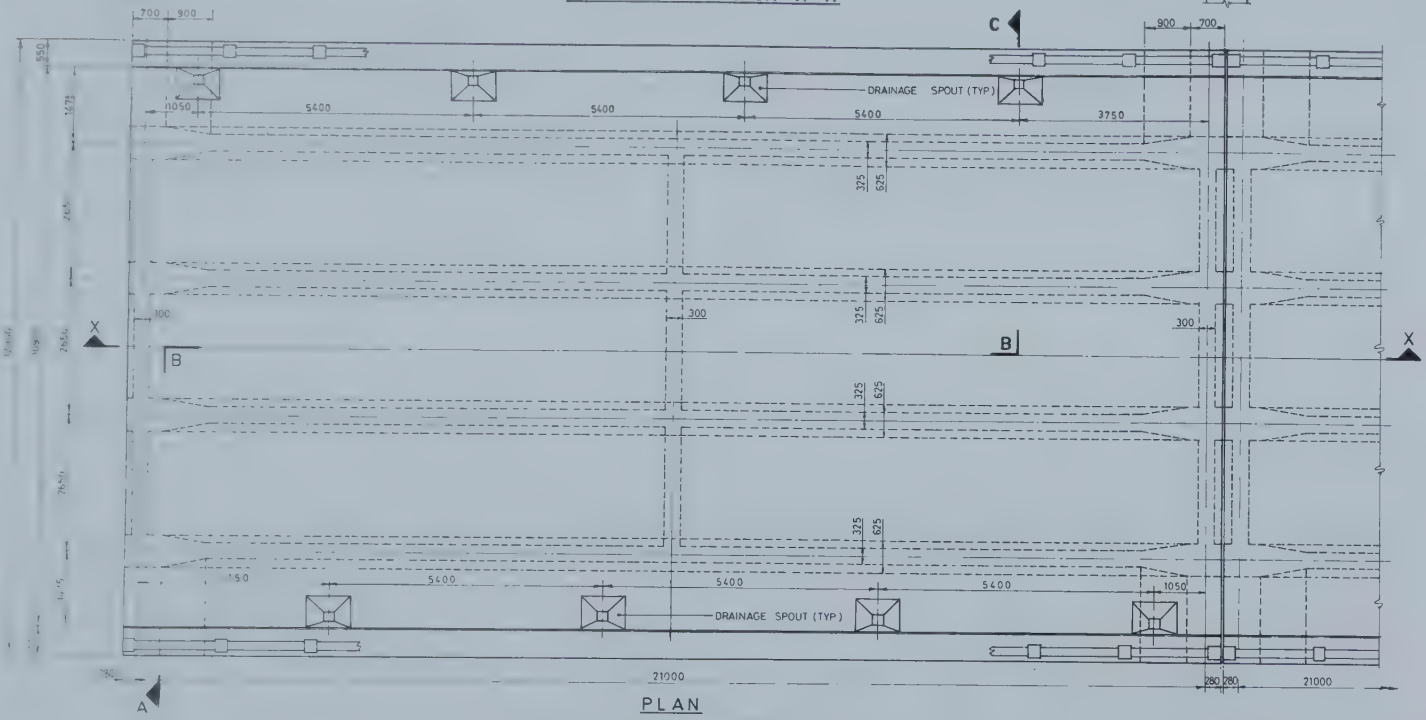
R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE
24·0 M SPAN WITH FOOTPATHS
SCHEDULE OF REINFORCEMENT

RECOMMENDED BY:		APPROVED BY:	1990
(M.P. MARWAH) E.E	(N.K. SINHA) S.E	(M.K. MUKHERJEE) C.E.	DRG. NO SD/217 Sh-2

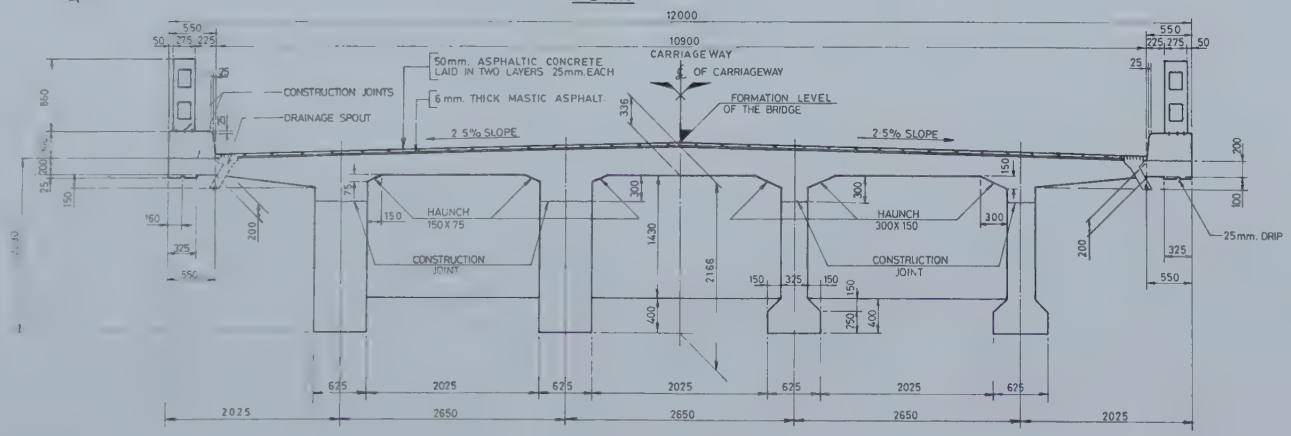
DRG. NO. SD/220



SECTIONAL ELEVATION X X



PLAN



SECTION A B C

NOTES :

This drawing shall be read in conjunction with the following drawings.

i) General notes Drg. No. SD / 200.

ii) Details of R.C.C. railings..Drg.No. SD/201.

iii) Details of elastomeric bearings Drg.No SD/203.

iv) Details of rocker & roller bearings Drg. No SD/204.

v) Details of miscellaneous items..Drg. No. SD/205.

vi) Details of deck slab (for bridges without footpaths)... Drg. No. SD/222.

vii) Details of longitudinal girders Drg No SD/ 224

viii) Details of cross girders Drg. No. SD/ 225.

ix) Schedule of reinforcement..Drg. No. SD/226. Sh-1 & Sh-2.

MKD	DATE	DESCRIPTION	BY
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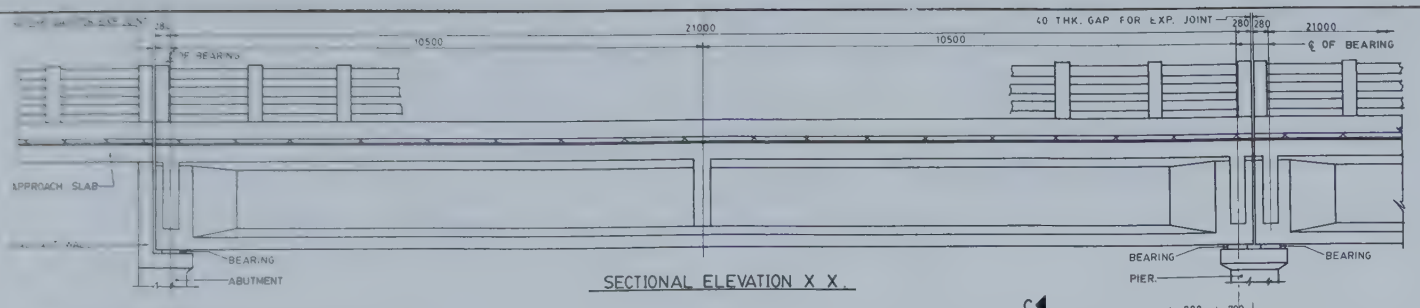
GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
(ROADS WING), NEW DELHI.

STANDARD DRAWINGS FOR ROAD BRIDGES

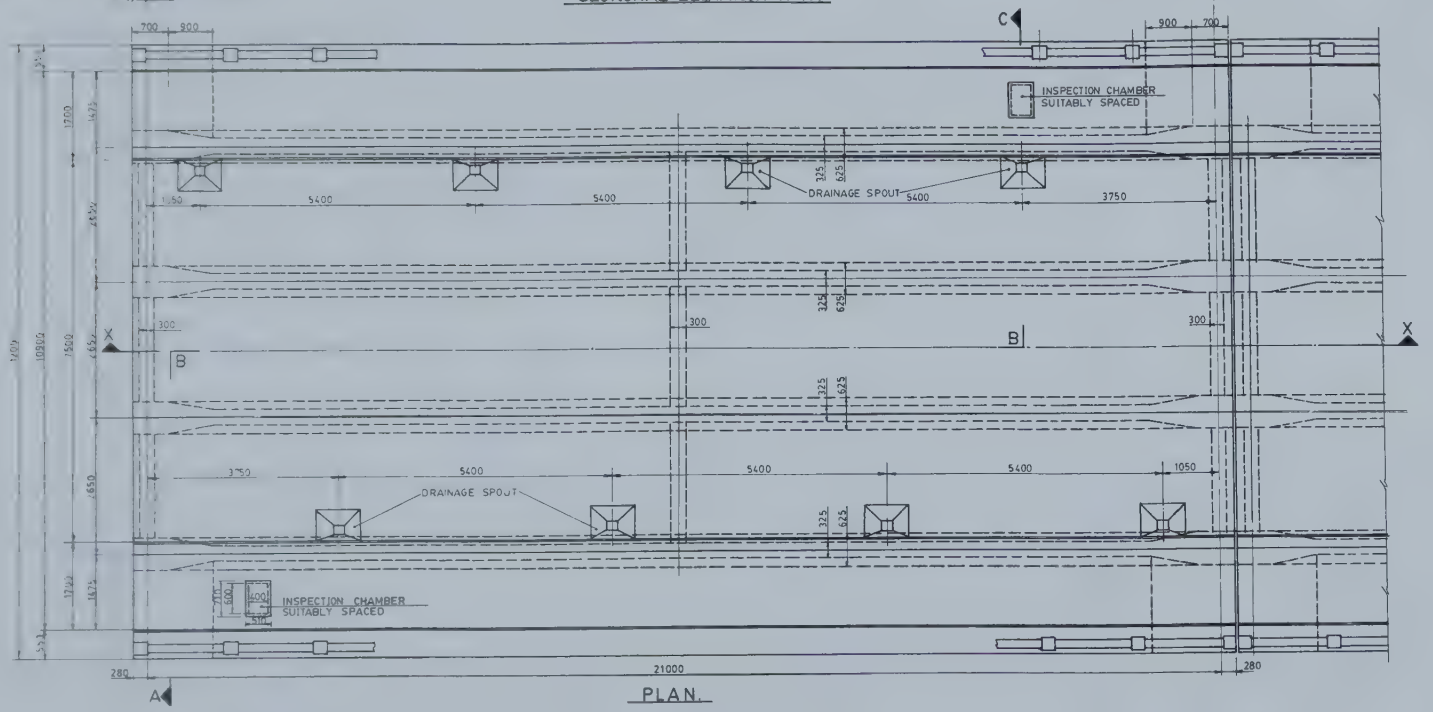
R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE 21·0 M SPAN WITHOUT FOOTPATHS GENERAL ARRANGEMENT.

RECOMMENDED BY :		APPROVED BY :	1991
(M.P. MARWAH) E.E	(N.K SINHA) S.E	(M.K. MUKHERJEE). C.E	DRG. NO. SD/220

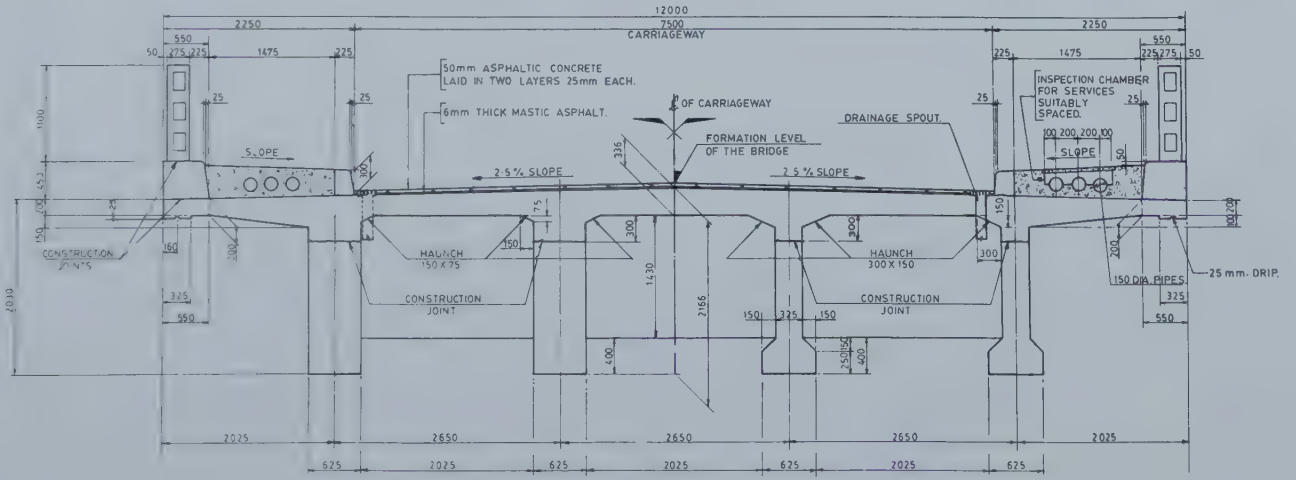
DRG. NO SD/221



SECTIONAL ELEVATION X X.



PLAN.



SECTION A B C.

NOTES:

This drawing shall be read in conjunction with the following drawings.

i) General notes..Drg. No. SD/200.
ii) Details of R.C.C. railings....Drg. No. SD/202.
iii) Details of elastomeric bearings....Drg.No. SD/203.
iv) Details of rocker and roller bearings..Drg. No. SD/204.
v) Details of miscellaneous items...Drg No. SD/205
vi) Details of deck slab (for bridges with footpaths).... Drg.No. SD/223.
vii) Details of longitudinal girders... Drg. No. SD/224.
viii) Details of cross girders... Drg.No SD/225.
ix) Schedule of reinforcement... Drg. No. SD/227 Sh-1&Sh-2

MKD	DATE	DESCRIPTION	BY
		REVISION.	

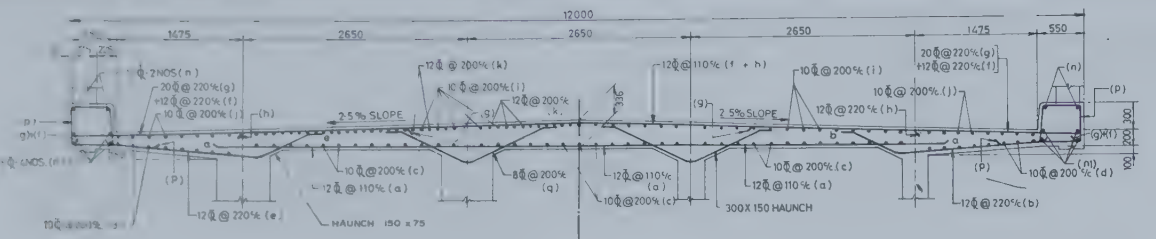
GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
(ROADS WING), NEW DELHI.

STANDARD DRAWINGS FOR ROAD BRIDGES

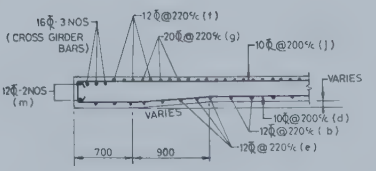
R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE 21·0 M. SPAN WITH FOOTPATHS GENERAL ARRANGEMENT.

RECOMMENDED BY:		APPROVED BY:	1991
(M.P. MARWAH.) E.E.	(N.K. SINHA) S.E.	(M.K. MUKHERJEE) C.E	DRG. NO. SD/221

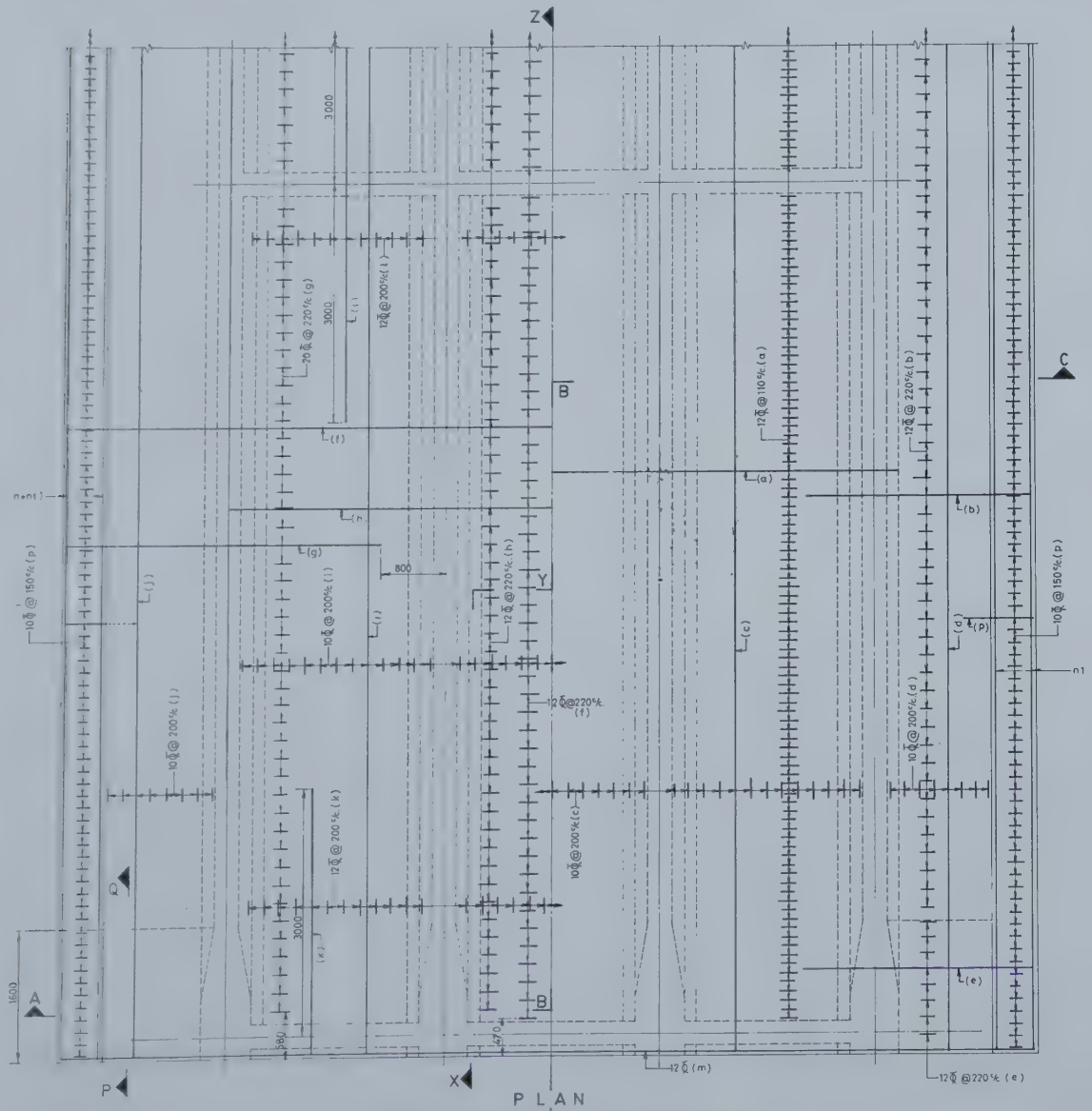
DRG. NO. SD/222



CROSS SECTION A B C

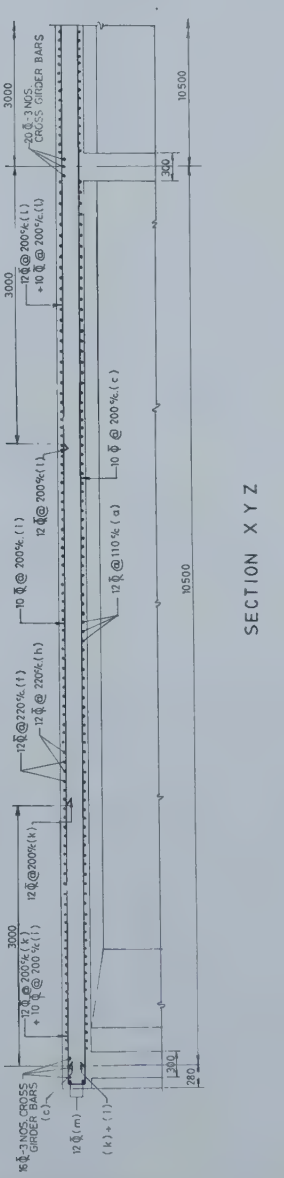


SECTION P Q



PLAN

HALF TOP REINFORCEMENT, HALF BOTTOM REINFORCEMENT



SECTION X Y Z

NOTES

1. The reinforcement for railing posts should be properly anchored in the deck slab before casting the slab.
2. This drawing shall be read in conjunction with following drawings.

i) General notes--Drg. No. SD/200.
ii) Details of R.C.C. railing--Drg.No. SD/201.
iii) Details of elastomeric bearings--Drg. No. SD/203.
iv) Details of rocker and roller bearings--Drg. No. SD/204
v) Details of miscellaneous items--Drg. No SD/205.
vi) General arrangement (for bridges without footpaths) --Drg. No. SD/220.
vii) Details of longitudinal girders--Drg. No. SD/224.
viii) Details of cross girders--Drg. No. SD/225.
ix) Schedule of reinforcement--Drg. No. SD/226. Sh-1 & Sh-2.

MKD.	DATE	DESCRIPTION	BY
		REVISION	

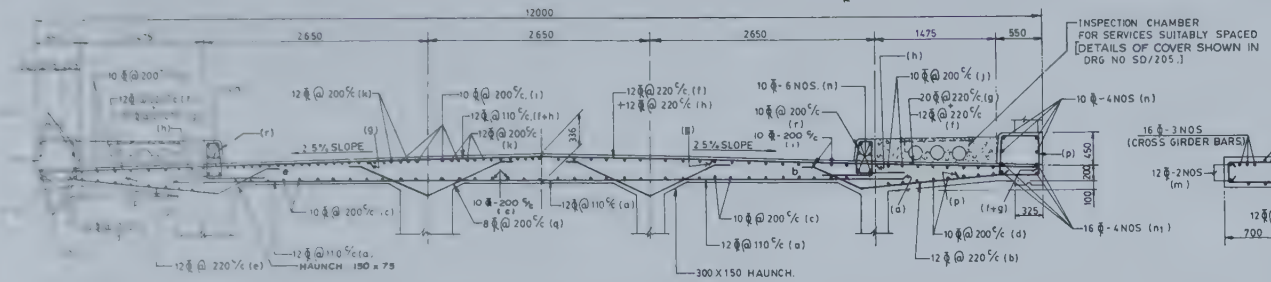
GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
(ROADS WING), NEW DELHI

STANDARD DRAWINGS FOR ROAD BRIDGES.

R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE 21·0 M SPAN WITHOUT FOOTPATHS DETAILS OF DECK SLAB

RECOMMENDED BY :		APPROVED BY :	1991
(M.P. MARWAH) E E	(N.K SINHA) S E	(M.K MUKHERJEE) C E	DRG. NO. SD/222

DRG. NO. SD/223.

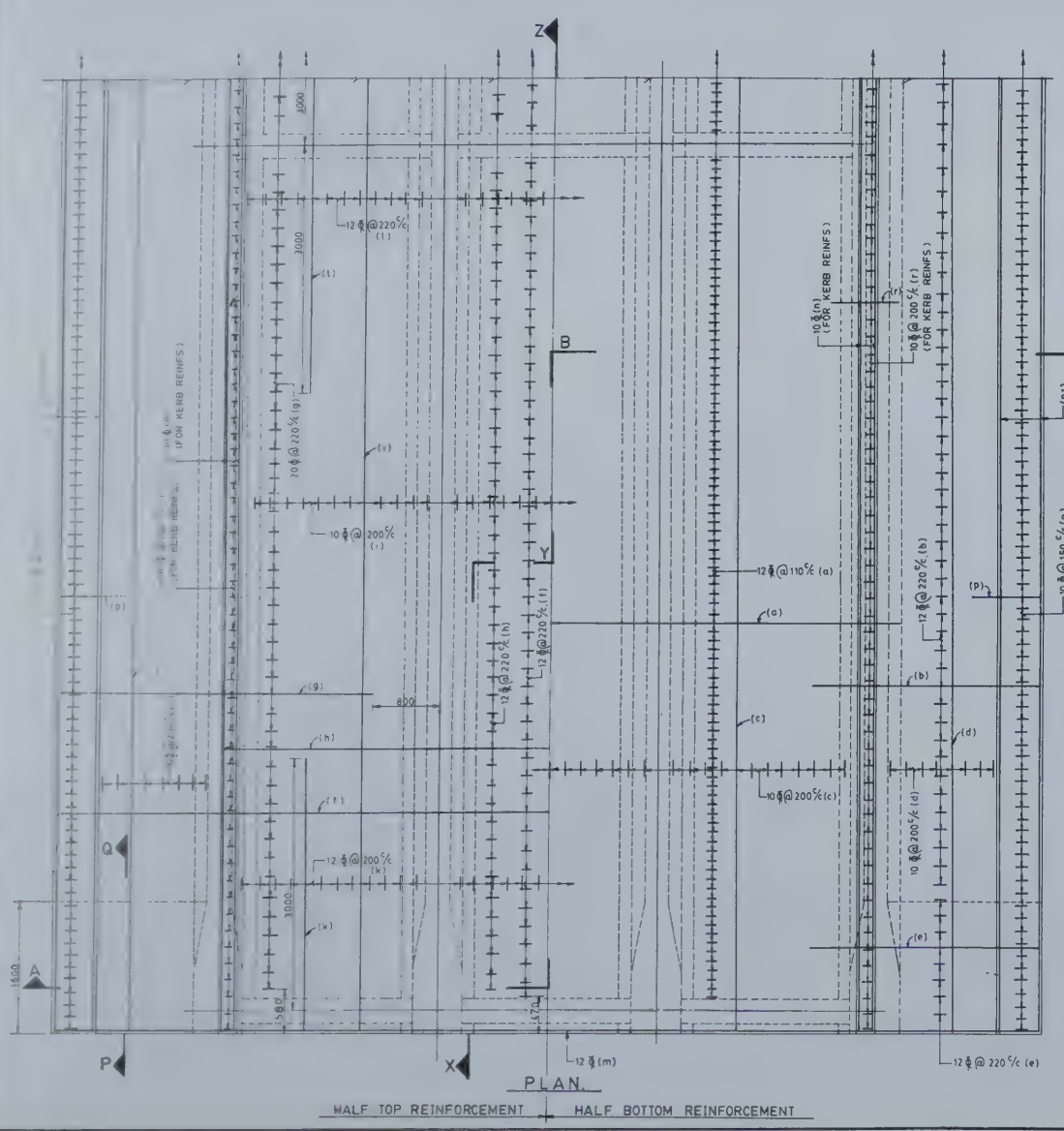


CROSS SECTION A B C.

SECTION P Q.

NOTES:-

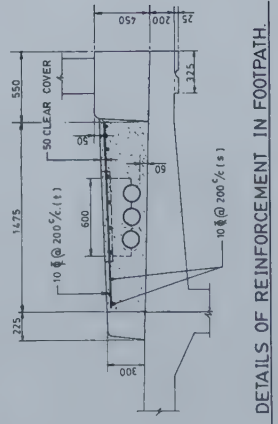
1. The reinforcement for railing post should be properly anchored in the deck slab before casting the slab.
2. This drawing shall be read in conjunction with following drawings.
   - i) General notes.... Drg. No. SD/200.
   - ii) Details of R.C.C. railing....Drg. No. SD/202.
   - iii) Details of elastomeric bearings....Drg. No. SD/203.
   - iv) Details of rocker and roller bearings....Drg. No. SD/204
   - v) Details of miscellaneous items....Drg. No. SD/205.
   - vi) General arrangement.(for bridges with footpaths.). Drg. No. SD/221.
   - vii) Details of longitudinal girders....Drg. No. SD/224
   - viii) Details of cross girders....Drg. No. SD/225.
   - ix) Schedule of reinforcement....Drg. No. SD/227, Sh-1 & Sh-2



PLAN.

HALF TOP REINFORCEMENT + HALF BOTTOM REINFORCEMENT

SECTION X Y Z.



DETAILS OF REINFORCEMENT IN FOOTPATH.

MKD	DATE	DESCRIPTION	BY
		REVISION.	

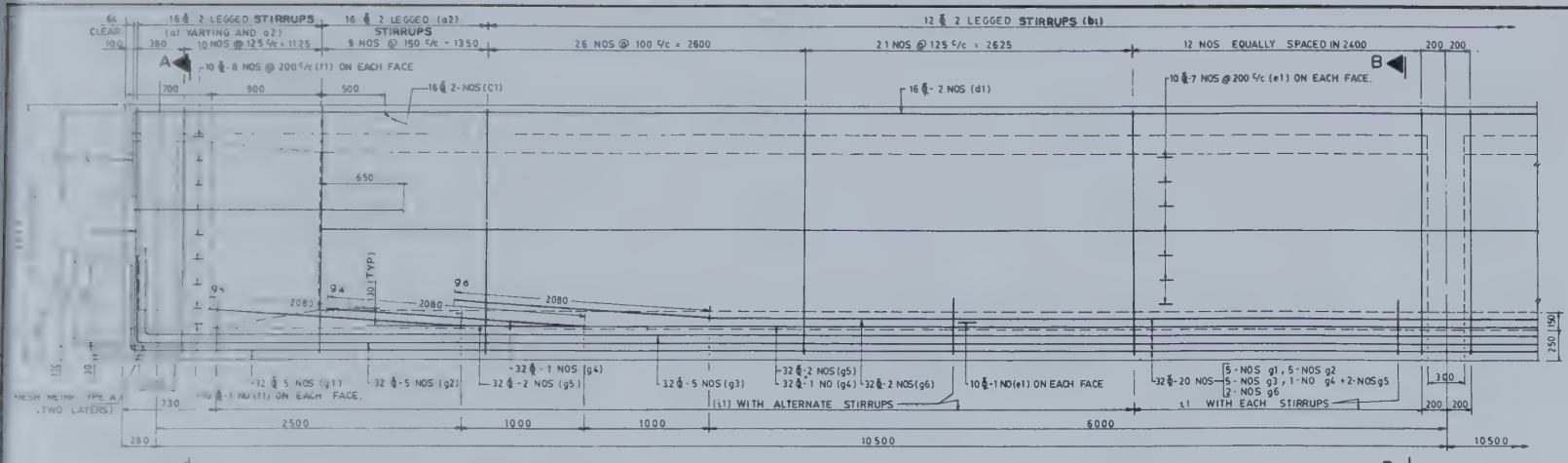
GOVERNMENT OF INDIA.
MINISTRY OF SURFACE TRANSPORT
(ROADS WING), NEW DELHI.

STANDARD DRAWINGS FOR ROAD BRIDGES.

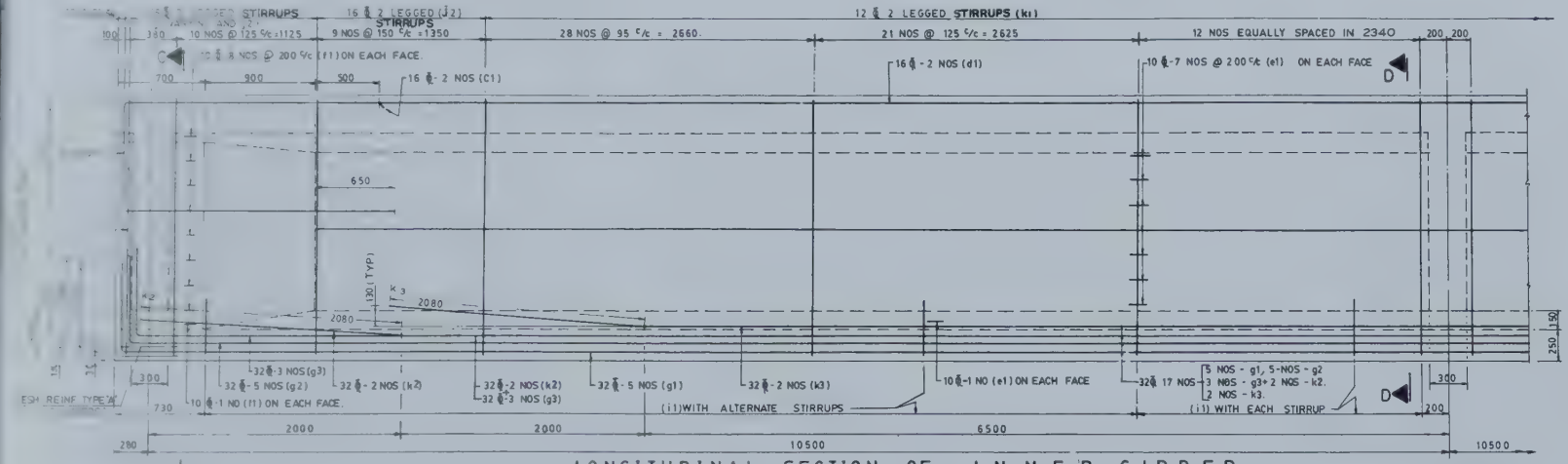
R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE
21·0 M. SPAN WITH FOOTPATHS.
DETAILS OF DECK SLAB.

RECOMMENDED BY:		APPROVED BY:	1991
M. P. MARWAH. EE	N. K. SINHA. SE	M. K. MUKHERJEE C.E	DRG. NO. SD/223.

DRG. NO SD/224


12 ϕ 2 LEGGED STIRRUPS (b1)
16 ϕ 2 LEGGED (a2) STIRRUPS
16 ϕ 2 LEGGED STIRRUPS (a1 VARYING AND a2)
9 NOS @ 150 c/c = 1350
26 NOS @ 100 c/c = 2600
21 NOS @ 125 c/c = 2625
12 NOS EQUALLY SPACED IN 2400
10 ϕ-8 NOS @ 200 c/c (f1) ON EACH FACE
16 ϕ- 2 NOS (C1)
16 ϕ- 2 NOS (d1)
10 ϕ-7 NOS @ 200 c/c (e1) ON EACH FACE.
32 ϕ- 1 NOS (g4)
32 ϕ- 5 NOS (g1)
32 ϕ- 5 NOS (g2)
32 ϕ- 2 NOS (g5)
32 ϕ- 5 NOS (g3)
32 ϕ-2 NOS (g5)
32 ϕ- 1 NO (g4)
32 ϕ-2 NOS (g6)
10 ϕ-1 NO(e1) ON EACH FACE
32 ϕ-20 NOS
5 - NOS g1, 5 - NOS g2
5 - NOS g3, 1 - NO g4 + 2 - NOS g5
2 - NOS g6
(i1) WITH ALTERNATE STIRRUPS
i1 WITH EACH STIRRUPS
10 ϕ-1 NO (f1) ON EACH FACE.
MESH REINF TYPE A (TWO LAYERS)
2500
1000
1000
6000
10500

LONGITUDINAL SECTION OF OUTER GIRDER

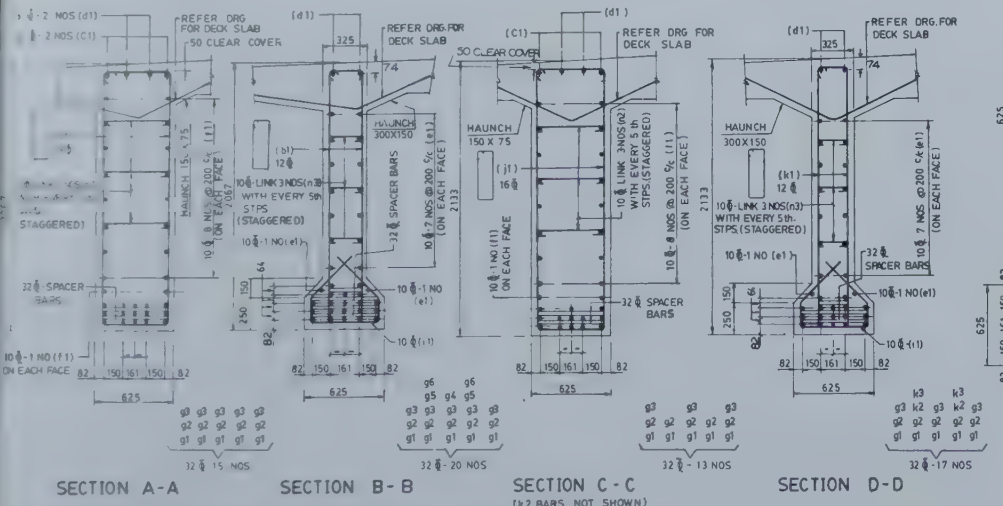

12 ϕ 2 LEGGED STIRRUPS (k1)
16 ϕ 2 LEGGED (j2) STIRRUPS
10 NOS @ 125 c/c = 1125
9 NOS @ 150 c/c = 1350
28 NOS @ 95 c/c = 2660.
21 NOS @ 125 c/c = 2625
12 NOS EQUALLY SPACED IN 2340
10 ϕ-8 NOS @ 200 c/c (f1) ON EACH FACE.
16 ϕ- 2 NOS (C1)
16 ϕ- 2 NOS (d1)
10 ϕ-7 NOS @ 200 c/c (e1) ON EACH FACE
32 ϕ-3 NOS (g3)
32 ϕ- 5 NOS (g2)
32 ϕ- 2 NOS (k2)
32 ϕ-2 NOS (k2)
32 ϕ-3 NOS (g3)
32 ϕ- 5 NOS (g1)
32 ϕ- 2 NOS (k3)
10 ϕ-1 NO (e1) ON EACH FACE
32 ϕ 17 NOS
5 NOS - g1, 5-NOS - g2
3 NOS - g3 + 2 NOS - k2.
2 NOS - k3.
(i1) WITH ALTERNATE STIRRUPS
(i1) WITH EACH STIRRUP
10 ϕ-1 NO (f1) ON EACH FACE.
MESH REINF TYPE A
2000
2000
6500
10500

LONGITUDINAL SECTION OF INNER GIRDER

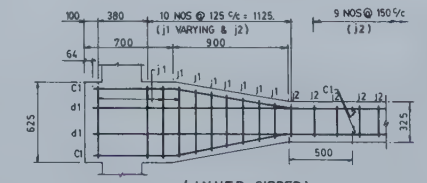
NOTES

1. Longitudinal girders shall be given upward camber on account of dead load deflection as given in the table -I.
2. 32 ϕ spacer bars shall be provided @ 1m c/c between two tiers of longitudinal bars of girders.
3. This drawing shall be read in conjunction with the following drgs.

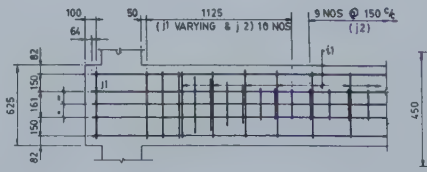
i) General notes ... Drg. No. SD/ 200.
ii) Details of elastomeric bearing ... Drg. No. SD/ 203.
iii) Details of rocker and roller bearing... Drg. No. SD/ 204.
iv) General arrangement (for bridges without footpaths)... Drg. No. SD/ 220.
v) General arrangement (for bridges with footpaths)... Drg. No. SD/ 221.
vi) Details of deck slab (for bridges without footpaths).. Drg. No. SD/ 222.
vii) Details of deck slab (for bridges with footpaths)... Drg. No. SD/ 223.
viii) Details of cross girders ... Drg. No. SD/ 225.
ix) Schedule of reinforcement (for bridges without footpaths) Drg. No. SD/ 226 .Sh-1 & Sh-2.
x) Schedule of reinforcement (for bridges with footpaths) Drg. No. SD/ 227. Sh-1 & Sh-2.


REFER DRG FOR DECK SLAB
50 CLEAR COVER
HAUNCH 300X150
HAUNCH 150 X 75
32 ϕ SPACER BARS
10 ϕ-1 NO (e1)
10 ϕ-1 NO (f1) ON EACH FACE
10 ϕ-LINK 3 NOS (n3) WITH EVERY 5th STPS (STAGGERED)
10 ϕ-8 NOS @ 200 c/c (f1) (ON EACH FACE)
10 ϕ-7 NOS @ 200 c/c (e1) (ON EACH FACE)
10 ϕ-LINK 3 NOS (n2) WITH EVERY 5 th STPS (STAGGERED)
10 ϕ-1 NO (f1) ON EACH FACE
625
32 ϕ 15 NOS
32 ϕ-20 NOS
32 ϕ- 13 NOS
32 ϕ-17 NOS

SECTION A-A SECTION B-B SECTION C-C (k2 BARS NOT SHOWN) SECTION D-D



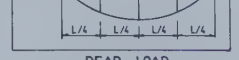
(INNER GIRDER)
PLAN SHOWING WEB REINF (TOP) AT THE END



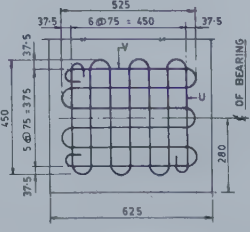
(INNER GIRDER)
PLAN SHOWING BULB REINFORCEMENT AT THE END
(SIMILAR SCHEME OF DETAILING WILL BE FOLLOWED FOR OUTER GIRDERS)

TABLE -I

	1/4 POINT	MID SPAN	1/4 POINT
BRIDGE WITH F P	10 m m.	14 m m.	10 m m.
BR WITH OUT F P	9 m m	12 m m.	9 m m.



DEAD LOAD DEFLECTION DIAGRAM



8 ϕ MESH REINFORCEMENT TYPE -A

MKD	DATE	DESCRIPTION	BY
		REVISION.	

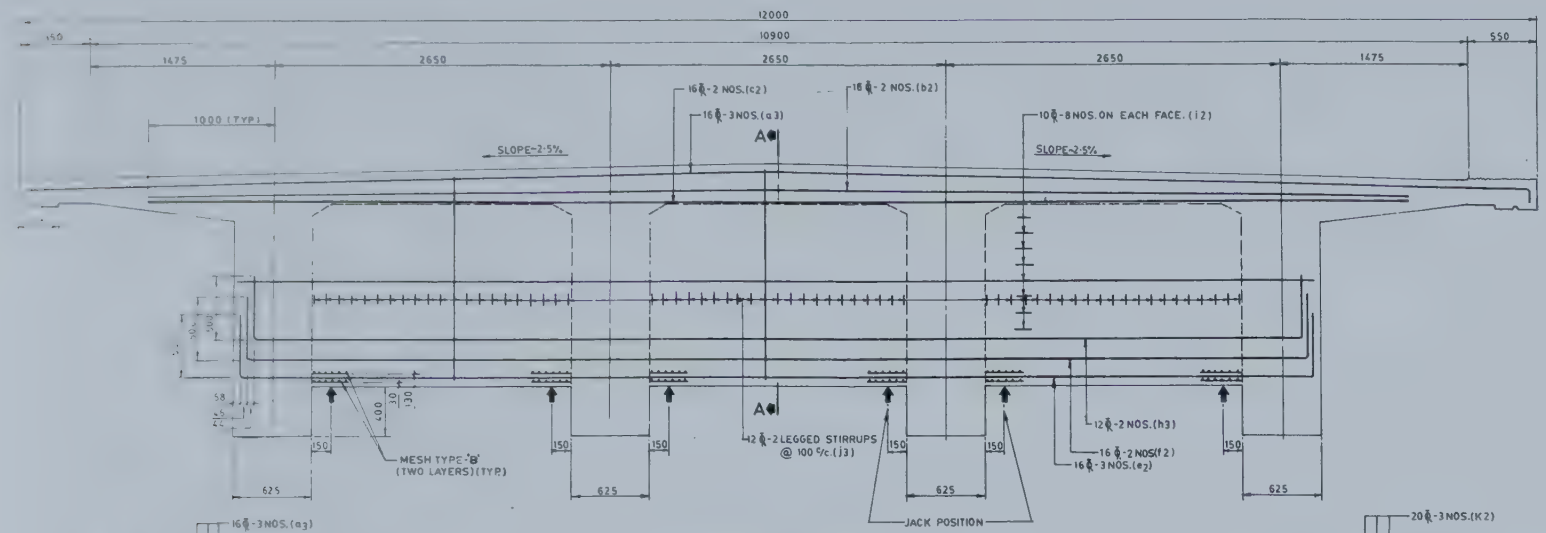
GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
(ROADS WING), NEW DELHI.

STANDARD DRAWINGS FOR ROAD BRIDGES

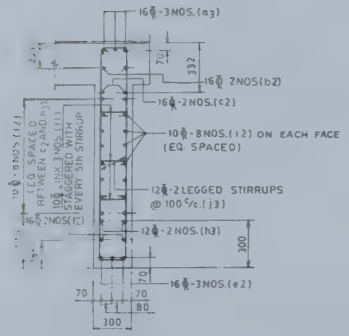
R.C.C. T BEAM AND SLAB SUPERSTRUCTURE
21·0M. SPAN WITH & WITHOUT FOOTPATHS
DETAILS OF LONGITUDINAL GIRDERS.

RECOMMENDED BY		APPROVED BY	1991
(M. P. MARWAH). E.E.	(N.K. SINHA). S.E	(M K MUKHERJEE) C E	DRG. NO. SD/ 224.

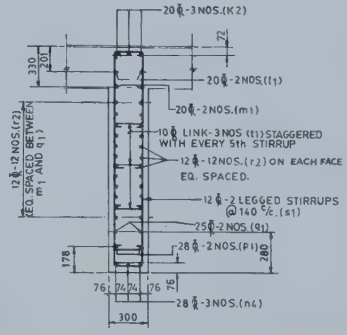
DRG. NO. SD/225



LONGITUDINAL SECTION
OF END CROSS GIRDER



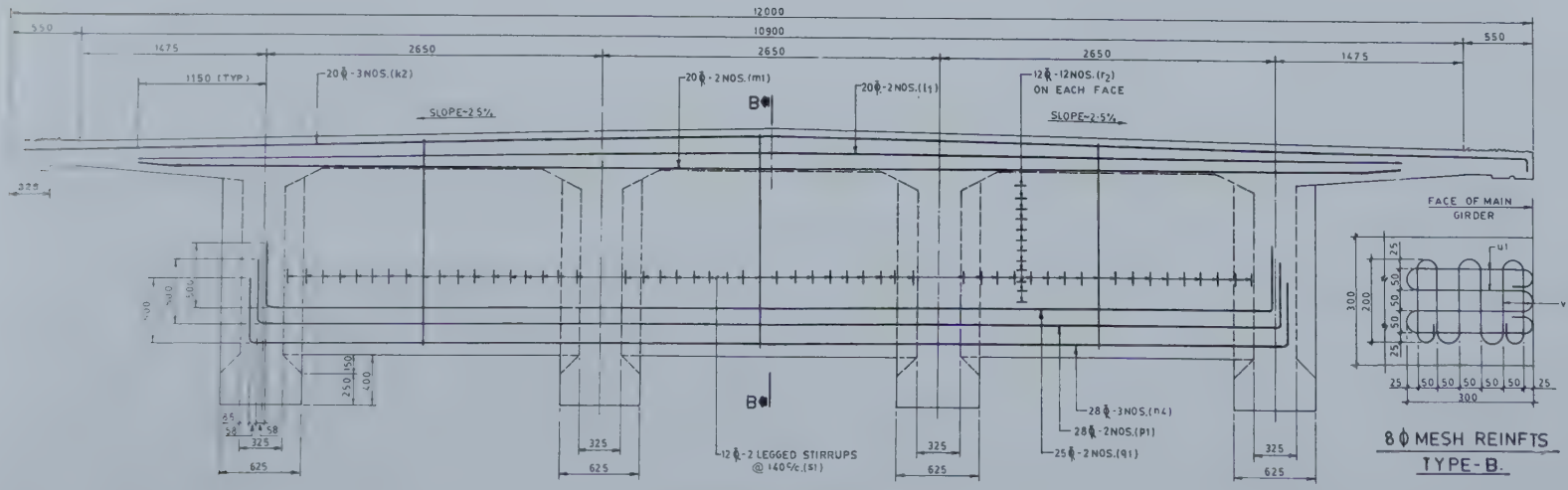
SECTION A A


20 ϕ-3 NOS.(k2)
20 ϕ-2 NOS.(l1)
20 ϕ-2 NOS.(m1)
10 ϕ LINK-3 NOS (t1) STAGGERED WITH EVERY 5th STIRRUP
12 ϕ-12 NOS.(r2) ON EACH FACE EQ. SPACED.
12 ϕ-2 LEGGED STIRRUPS @ 140 c/c.(s1)
25 ϕ-2 NOS (q1)
28 ϕ-2 NOS.(p1)
28 ϕ-3 NOS.(n4)
12 ϕ-12 NOS.(r2) (EQ. SPACED BETWEEN m1 AND q1)
300

SECTION B B

1. The location of jacks for lifting of the superstructure to replace bearings etc. is shown thus ⬆. This shall be distinctly etched for easy identification on the end cross girders and pier / abutment caps.
2. During the lifting operation, all the six jacks placed under the end cross-girder in line with the bearings shall be operated simultaneously using single operating console, grouping the pump and control system, so as to ensure that the reactions on all the six jacks are equal at all times.
3. Capacity of each jack shall not be less than 41 Tons.
4. This drawing shall be read in conjunction with the following drawings.

i) General notes...Drg. No. SD/200.
ii) Details of elastomeric bearings... Drg. No. SD/203.
iii) Details of rocker and roller bearings...Drg. No. SD/204
iv) General arrangement (for bridges without foot paths)... Drg. No. SD/220.
v) General arrangement (for bridges with foot paths). Drg. No. SD/221.
vi) Details of deck slab (for bridges without foot paths)... Drg. No. SD/222.
vii) Details of deck slab (for bridges with foot paths)... Drg. No. SD/223.
viii) Details of longitudinal girders...Drg. No. SD/224
ix) Schedule of reinforcements (for bridges without foot paths)...Drg. No. SD/226 Sh.-1 & Sh.-2
x) Schedule of reinforcements (for bridges with foot paths)...Drg. No. SD/227 Sh.-1 & Sh.-2.



LONGITUDINAL SECTION
OF INTERMEDIATE CROSS GIRDER

8 ϕ MESH REINFTS
TYPE-B.

MKD	DATE	DESCRIPTION	81
		REVISION	

GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
(ROADS WING), NEW DELHI

STANDARD DRAWINGS FOR ROAD BRIDGES

R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE 21·0 M. SPAN WITH AND WITHOUT FOOT PATHS. DETAILS OF CROSS GIRDERS.

RECOMMENDED BY.		APPROVED BY	1991
(M.P. MARWAH). E.E.	(N.K. SINHA). S.E.	(M.K. MUKHERJEE). C.E.	DRG. NO. SD/225

Drg no SD/226-sh1

SCHEDULE OF REINFORCEMENT (PER SPAN)

A) HYSD BARS

Sl No	Type of bars	Shape of bars (not to scale) (dimensions are in millimetres)	Dia of bars (mm)	Length of each bar (mm)	No of bars	Total length (m)	Weight (Kg)
		Slab					
1	a	8575	12	8575	186	1594·95	1435·45
2	b	150, R=120, 140, 249, 530, 1692, 500, R=120, 137	12	2976	162	482·11	433·90
3	c	150, L, 150, 21460, L=Varying from 109 to 212	10	21960	39	856·44	513·86
4	d	140, L, 901, 18360, R=100, 140, 80, L, 650, Varying from 0 to 701, 650, R=100, L=Varying from 68 to 270	10	21960	16	351·36	210·82
5	e	Varying from 249 to 313, 150, Varying 532 to 700, R=120, Varying from 1543 to 1692, 140, 500, R=120, Varying from 137 to 198	12	2987	32	95·58	86·02
6	f	5952, 5952, 75, R=120, 75, 149	12	12054	94	1133·08	1019·77
7	g	3826, 120, 96	20	3946	184	726·06	1815·16
8	h	3976, 3976, R=120, 99	12	7952	92	731·58	658·42
9	i	21460, L, 150, 150, L, L=Varying from 109 to 212	10	21960	39	856·44	513·86
10	j	21460, L, 75, 75, L, L=Varying from 68 to 270	10	21888	16	350·21	210·12
11	k	3230, L, 170, L=Varying from 109 to 212	12	3488	72	251·14	226·03
12	l	6000	12	6000	36	216·00	194·40
13	m	11900	12	11900	4	47·60	42·84
14	n	21460	10	21460	4	85·84	51·50
15	n1	21460	16	21460	8	171·68	274·69
16	p	405, 380, 380, 443, Varying from 37 to 54, 500	10	2208	288	635·90	381·54
17	q	150, R=80, 150, 393, 860, 950, R=80, 433	8	2110	208	438·88	175·55

LONGITUDINAL GIRDERS

1	a1	L_1=Varying from 1929 to 1933, L_2=Varying from 1937 to 1941, Varying from 193 to 493	16	4876	44	214·54	343·26
2	a2	193, 1933, 1937, 193	16	4576	36	164·74	263·58
3	b1	193, 1933, 1937, 193	12	4496	236	1061·06	954·95
4	c1	708, R=96, Elevation, 166, 636, 913, 500, Plan	16	2693	16	43·09	68·94
5	d1	21432, 708, 708, R 96	16	22720	8	181·76	290·82
6	e1	18360	10	18360	64	1175·04	705·02
7	f1	636, 913, 650, 160	10	2199	144	316·66	190·00

Sl No	Type of bars	Shape of bars (not to scale) (dimensions are in millimetres)	Dia of bars (mm)	Length of each bar (mm)	No of bars	Total length (m)	Weight (kg)
8	g_1	716, R=192, 716, 21432	32	22608	20	452·16	2848·61
9	g_2	716, R=192, 716, 21304	32	22480	20	449·60	2832·48
10	g_3	716, R=192, 716, 21176	32	22352	16	357·63	2253·08
11	g_4	2080, 2080, 162, 14000	32	18160	2	36·32	228·82
12	g_5	2080, 2080, 162, 16000	32	20160	4	80·64	508·03
13	g_6	2080, 2080, 162, 12000	32	16160	4	64·64	407·23
14	i_1	150, 450, 315, 485, 493	10	1733	356	616·95	370·17
15	j_1	L_1=Varying from 1995 to 1999, L_2=Varying from 2003 to 2007, Varying from 193 to 493	16	5008	44	220·35	352·56
16	j_2	193, 1999, 2003, 193	16	4708	36	169·49	271·18
17	k_1	193, 1999, 2003, 193	12	4628	244	1129·23	1016·31
18	k_2	2080, 2080, 162, 17000	32	21160	4	84·64	533·23
19	k_3	2080, 2080, 162, 13000	32	17160	4	68·64	432·43
20	n_2	L, 140, 140, L=Varying from 213 to 513	10	583	72	41·98	25·19
21	n_3	213, 140, 140	10	433	336	145·49	87·29

B) M.S. BARS (MESH REINFORCEMENT IN LONGITUDINAL GIRDERS)

1	u	25, 375, 375, 30, 30, 375, 375, 25, 75 75 75 75 75 75	8	3550	16	56·80	22·72
2	v	75 75 75 75 75, 30, 25, 30, 375, 450, 25	8	3506	16	56·10	22·44

NOTES

1. Dimensions in the schedule are given as per IS:2502-1963.
2. The actual length of the bars will be determined by the actual laps with splices adopted at site.
3. This drawing shall be read in conjunction with following drawings.
   i) General notes ---- Drg. No.-SD/200.
   ii) Details of deckslab (For bridges without footpaths) ---- Drg. No.-SD/222.
   iii) Details of longitudinal girders -- Drg. No.-SD/224.

MKD	DATE	DESCRIPTION	BY
		REVISION	

GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
(ROADS WING), NEW DELHI

STANDARD DRAWINGS FOR ROAD BRIDGES

R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE
21·0M SPAN WITHOUT FOOTPATHS
SCHEDULE OF REINFORCEMENT

RECOMMENDED BY		APPROVED BY	1991
(M.P MARWAH) E I E	(N K SINHA) S E	(M.K. MUKHERJEE) C E	DRG NO SD/226-sh.1.

DRG. NO. SD/226-Sh-2

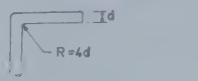
SCHEDULE OF REINFORCEMENT (PER SPAN)

A) H Y S D Bars

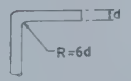
Sl No.	Type of bars.	Shape of bars. (not to scale) (dimensions are in millimetres.)	Dia of bars. (mm.)	Length of each bar (mm.)	No. of bars.	Total length (m.)	Weigth (kg.)
		Cross Girders.					
1	a_3	5952, 5952, R=160, 95, 95, 152	16	12094	6	72·56	116·10
2	b_2	1776, 6400, 1776, 50	16	9952	4	39·81	63·70
3	c_2	9950	16	9950	4	39·80	63·68
4	e_2	R=64, 508, 508, 8475	16	9395	6	56·37	90·19
5	f_2	R=64, 508, 508, 8383	16	9303	4	37·21	59·54
6	h_3	R=48, 506, 506, 8295	12	9235	4	36·94	33·25
7	i_2	R=40, 101, 101, 8443	10	8585	32	274·72	164·83
8	j_3	176, B, 176 — B = Varying from 1552 to 1642	12	3786	126	477·04	429·34
9	k_2	5952, 5952, R=200, 120, 120, 156	20	12144	3	36·43	91·08
10	l_1	1975, 6300, 1975, 50	20	10250	2	20·50	51·25
	m_1	386, 9480, 386, 29	20	10252	2	20·50	51·25
12	n_4	R=168, 514, 514, 8131	28	8935	3	26·81	128·69
13	p_1	R=168, 514, 514, 8015	28	8819	2	17·64	84·67
14	q_1	R=100, 512, 512, 7901	25	8775	2	17·55	66·69
15	r_1	R=48, 529, 529, 8151	12	9137	24	219·29	197·36
16	s_1	176, B, 176 — B = Varying from 1548 to 1642.	12	3782	54	204·23	183·81
17	t_1	140, 140, 196	10	416	135	56·16	33·70

B) M S BARS (MESH REINFORCEMENT IN CROSS GIRDERS)

18	u_1	30, 30, 50, 50, 50, 25, 250, 25	8	1453	24	34·87	13·95
19	v_1	30, 30, 25, 150, 25, 50, 50, 50, 50, 50	8	1510	24	36·24	14·50



d = Dia of bar
For bar upto 25 mm. dia



d Dia of bar
For bar above 25 mm. dia

MAXIMUM DEAD LOAD REACTIONS (IN K.N.)

At Abutment	At Pier
2137	4274

TOTAL QUANTITY (PER SPAN)*

1. STEEL 26·39 T. H.Y.S.D BARS.
   0·08 T. M.S. BARS.
   (including 5% extra for laps and wastage)
2. (i) CONCRETE 152·60 m^3.

* Excluding quantities for rolling.

NOTES

1. Dimensions in the schedule are given as per IS: 2502 – 1963.
2. The exact length of the bars will be determined by the actual laps splices adopted at site.
3. This drawing shall be read in conjunction with following drawings
   i) General notes Drg No... SD/200.
   ii) Details of cross girders Drg No...SD/225
   iii) Schedule of reinforcement Drg No...SD/226-Sh-1.

MKD	DATE	DESCRIPTION	BY
		REVISION	

GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
(ROADS WING), NEW DELHI

STANDARD DRAWINGS FOR ROAD BRIDGES.

R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE
21·0 M. SPAN WITHOUT FOOTPATHS
SCHEDULE OF REINFORCEMENT

RECOMMENDED BY:		APPROVED BY:	1951
(M.P. MARWAH) E.E.	(N.K. SINHA) S.E.	(M.K. MUKHERJEE) C.E.	DRG. NO. SD/226-Sh-2

DRG. NO. SD/227-Sh-1.

SCHEDULE OF REINFORCEMENT (PER SPAN)

A) H.Y.S.D. Bars.

Sl. No.	Type of bars.	Shape of bars (not to scale) (dimensions are in millimetres.)	Dia of bars. (m.m.)	Length of each bar (m.m.)	No. of bars.	Total length. (m.)	Weight (kg.)
		Slab / Footpath					
	a	8575	12	8575	186	1594·95	1435·45
2	b	150, R=120, 500, 140, 137, 2496, 537, 1692, R=120	12	2976	162	482·11	433·90
3	c	150, 150, L, L, L = Varying from 109 to 212, 21460	10	21960	37	812·52	487·51
4	d	140, 18360, R=100, 140, 901, Varying from R=100 0 to 70, 901, 650, 650, L = Varying from 68 to 270	10	21960	16	351·36	210·82
5	e	150, Varying from 249 to 313, R=120, Varying from 530 to 700, Varying from 1543 to 1692, 500, 140, Varying from 137 to 198, R=120	12	2987	32	95·58	86·02
6	f	5952, 5952, 75, R=120, 75, 149	12	12054	94	1133·08	1019·77
7	g	3826, 120, 96	20	3946	184	726·06	1815·16
8	h	3976, 3976, R=120, 99	12	7952	92	731·58	658·42
9	i	21460, L, L, 150, 150, L = Varying from 109 to 212	10	21960	37	812·52	487·51
10	j	21460, L, L, 75, 75, L = Varying from 68 to 270	10	21888	16	350·21	210·12
11	k	3230, L, 170, L = Varying from 109 to 212.	12	3488	72	251·14	226·02
12	l	6000	12	6000	36	216·00	194·40
13	m	11900	12	11900	4	47·60	42·84
14	n	21460	10	21460	20	429·20	257·52
15	n_1	21460	16	21460	8	171·68	274·69
16	p	405, 530, 530, 438, 500, Varying from 37 to 54.	10	2503	288	720·86	432·52
17	q	150, R=80, 150, 193, 860, 950, R=80, 433	8	2110	208	438·88	175·55
18	r	80, 390, 390, 500, 500	10	1860	216	401·76	241·06
19	s	21460	10	21460	16	343·36	206·02
20	t	1400	10	1400	216	302·40	181·44
		LONGITUDINAL GIRDERS					
1	a_1	L_1 = Varying from 1929 to 1933. L_2 = Varying from 1937 to 1941. Varying from 193 to 493.	16	4876	44	214·54	343·26
2	a_2	193, 1933, 1937, 193	16	4576	36	164·74	263·58
3	b_1	193, 1933, 1937, 193	12	4496	236	1061·06	954·95

Sl. No	Type of bars.	Shape of bars. (not to scale) (dimensions are in millimetres)	Dia of bars. (m.m.)	Length of each bar. (m.m.)	No. of bars.	Total length. (m.)	Weigth (kg.)
4	c_1	708, R=96, Elevation, 166, 636, 913, 500, Plan	16	2693	16	43·09	68·94
5	d_1	21432, 708, R = 96, 708	16	22720	8	181·76	290·82
6	e_1	18360	10	18360	64	1175·04	705·02
7	f_1	913, 650, 160, 636	10	2199	144	316·66	190·00
8	g_1	716, R = 192, 716, 21432	32	22608	20	452·16	2848·61
9	g_2	716, R = 192, 716, 21304	32	22480	20	449·60	2832·48
10	g_3	716, R = 192, 716, 21176	32	22352	16	357·63	2253·08
11	g_4	2080, 2080, 162, 14000	32	18160	2	36·32	228·82
12	g_5	2080, 2080, 162, 16000	32	20160	4	80·64	508·03
13	g_6	2080, 2080, 162, 12000	32	16160	4	64·64	407·23
14	i_1	450, 450, 315, 485, 493	10	1733	356	616·95	370·17
15	j_1	L_1 = Varying from 1995 to 1999. L_2 = Varying from 2003 to 2007. Varying from 193 to 493.	16	5008	44	220·35	352·56
16	j_2	193, 1999, 2003, 193	16	4708	36	169·49	271·18
17	k_1	193, 1999, 2003, 193	12	4626	244	1129·23	1016·31
18	k_2	2080, 2080, 162, 17000	32	21160	4	84·64	533·23
19	k_3	2080, 2080, 162, 13000	32	17160	4	68·64	432·43
20	n_2	L, 140, 140, L = Varying from 213 to 513.	10	583	72	41·98	25·19
21	n_3	213, 140, 140	10	433	336	145·49	87·29

B) M.S. BARS (MESH REINFORCEMENT IN LONGITUDINAL GIRDERS)

1	u	25, 375, 37·5, 30, 30, 75 75 75 75 75 75, 25	8	3550	16	56·80	22·72
2	v	75, 75 75 75 75, 30, 30, 37·5, 450, 25	8	3506	16	56·10	22·44

NOTES

1. Dimensions in the schedule are given as per IS: 2502-1963
2. The exact length of the bars will be determined by the actual laps with splices adopted at site.
3. This drawing shall be read in conjuntion with following drawings
   - i) General notes ···· Drg. No.-SD/200.
   - ii) Details of deck slab (For bridges with footpaths)··· Drg. No.-SD/223.
   - iii) Details of longitudinal girders···· Drg. No.-SD/224

MKD	DATE	DESCRIPTION	BY
		REVISION	

GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
(ROADS WING) NEW DELHI

STANDARD DRAWINGS FOR ROAD BRIDGES

R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE 21·0 M. SPAN WITH FOOTPATHS. SCHEDULE OF REINFORCEMENT.

RECOMMENDED BY		APPROVED BY	1991
(M. P. MARWAH). E E	(N.K SINHA). S E	(M.K. MUKHERJEE) C. E	DRG. NO. SD/227-Sh-1.

DRG. NO. SD/227-Sh-2

SCHEDULE OF REINFORCEMENT (PER SPAN)

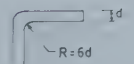
A) H.Y.S.D. Bars

Sl. No.	Type of bars	Shape of bars. (not to scale.) (dimensions are in millimetres.)	Dia of bars (m.m.)	Length of each bar. (m.m.)	No of bars.	Total length (m)	Weigth (kg)
		Cross Girders					
	a_1	5952, 5952, R=160, 95, 95, 152	16	12094	6	72·56	116·10
	b_2	1776, 6400, 1776, 50	16	9952	4	39·81	63·70
		9950	16	9950	4	39·80	63·68
4	e_2	508, R=64., 508, 8475	16	9395	6	56·37	90·19
5	f_2	508, R=64., 508, 8383	16	9303	4	37·21	59·54
6	h_3	506, R=48, 506, 8295	12	9235	4	36·94	33·25
7	i_2	101, R=40, 101, 8443	10	8585	32	274·72	164·83
8	l_3	176, B, 176 — B = Varying from 1552 to 1642	12	3786	126	477·04	429·34
9	k_2	120, 5952, 5952, 120, R=200, 156	20	12144	3	36·43	91·08
0	l_1	1975, 6300, 1975, 50	20	10250	2	20·50	51·25
	m_1	386, 9480, 386, 29	20	10252	2	20·50	51·25
	n_4	514, R=168, 514, 8131	28	8935	3	26·81	128·69
3	p_1	514, R=168, 514, 8015	28	8819	2	17·64	84·67
4	q_1	512, R=100, 512, 7901	25	8775	2	17·55	66·69
5	r_1	529, R=48, 529, 8151	12	9137	24	219·29	197·36
6	s_1	176, B, 176 — B = Varying from 1548 to 1642	12	3782	54	204·23	183·81
7	t_1	140, 140, 196	10	416	135	56·16	33·70

B) M.S. BARS (MESH REINFORCEMENT IN CROSS GIRDERS)

18	u_1	30 ⌀, 30 ⌀, 50, 50, 50, 25, 250, 25	8	1453	24	34·87	13·95
19	v_1	30 ⌀, 30 ⌀, 25, 150, 25, 50, 50, 50, 50, 50	8	1510	24	36·24	14·50

d = Dia of bar
For bar upto 25mm. dia



d = Dia of bar
For bar above 25mm. dia.

MAXIMUM DEAD LOAD REACTIONS (IN K.N)

At Abutment	At Pier
2408	4816.

TOTAL QUANTITY (PER SPAN)*

1. STEEL 27·27 T. H.Y.S.D. BARS.
   0·08 T. M.S. BARS.
   (including 5% extra for laps and wastage)
2. (i) CONCRETE 179·10 m^3

*Excluding quantities for railing.

NOTES

1. Dimensions in the schedule are given as per IS: 2502 - 1963.
2. The exact length of the bars will be determined by the actual laps splices adopted at site.
3. This drawing shall be read in conjunction with following drawings
   i) General notes --- Drg. No. SD/200.
   ii) Details of cross girders ------ Drg. No. SD/225.
   iii) Schedule of reinforcement ------ Drg. No. SD/227 Sh-1.

MKD.	DATE	DESCRIPTION.	BY
		REVISION	

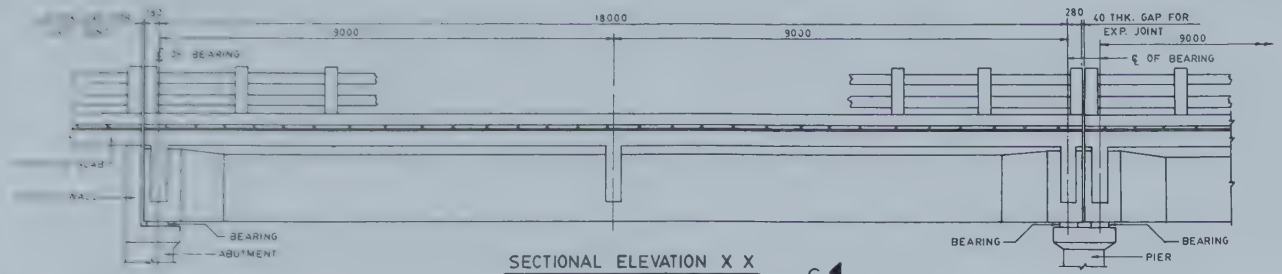
GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
(ROADS WING), NEW DELHI

STANDARD DRAWINGS FOR ROAD BRIDGES

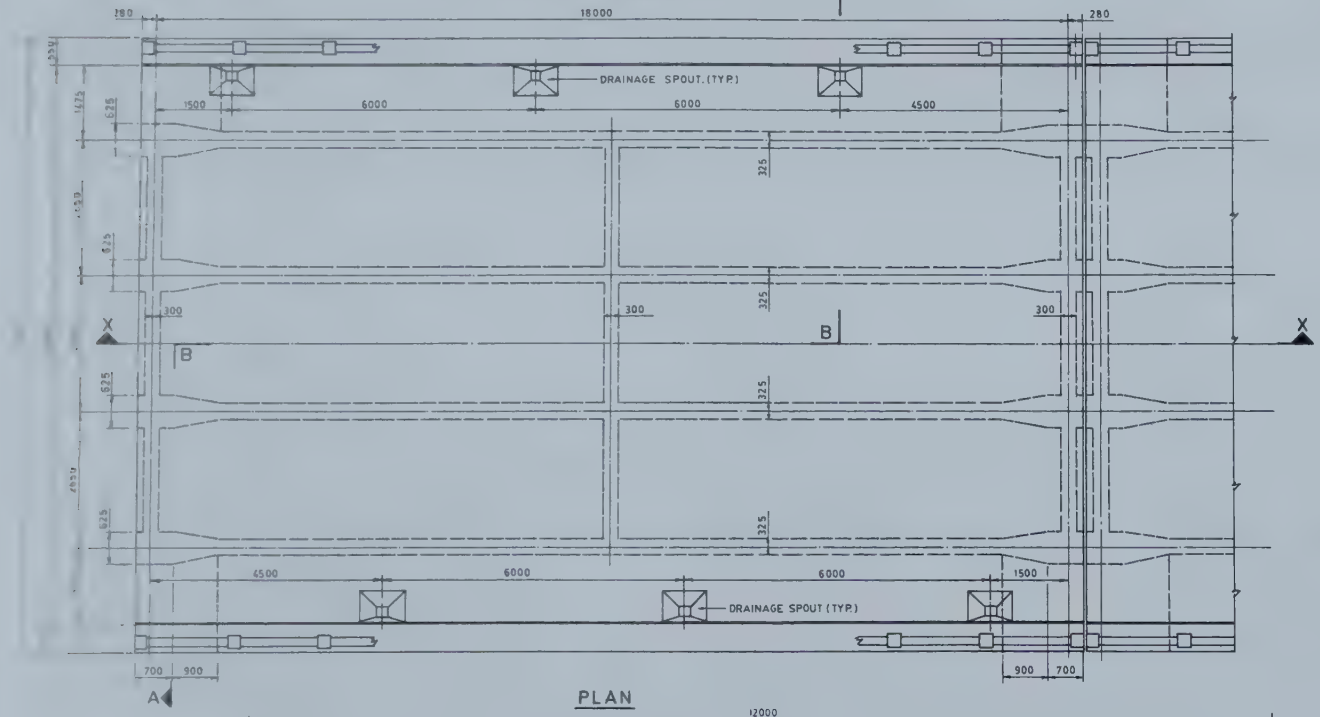
R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE
21·0M SPAN WITH FOOTPATHS.
SCHEDULE OF REINFORCEMENT.

RECOMMENDED BY:		APPROVED BY:	1991
(M.P. MARWAH). E.E.	(N.K. SINHA). S.E.	(M.K. MUKHERJEE) C.E.	DRG NO SD/227-Sh-2

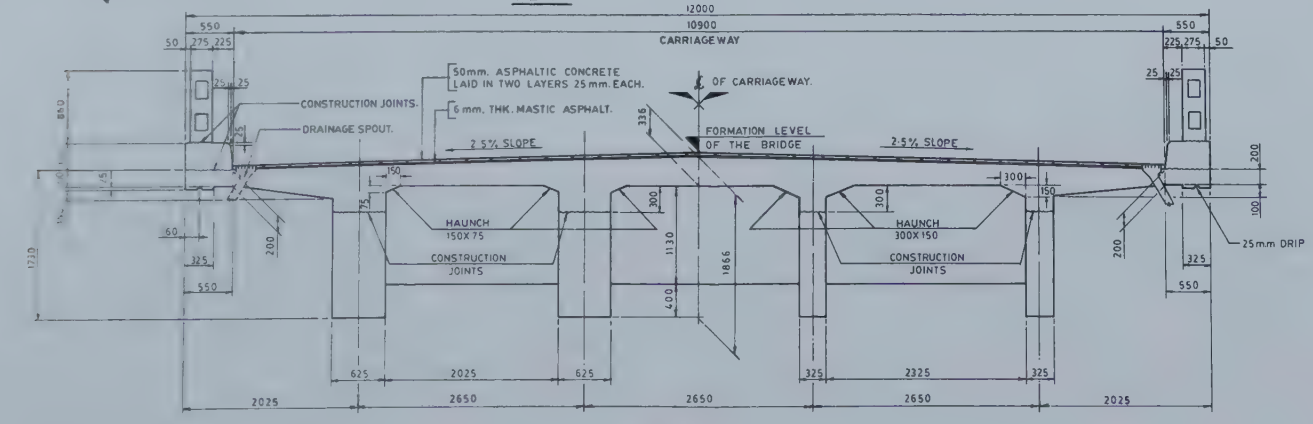
DRG. NO. SD/230



SECTIONAL ELEVATION X X



PLAN



SECTION A B C

NOTES :

This drawing shall be read in conjunction with the following drawings.

i) General notes... Drg. No. SD/200.
ii) Details of R.C.C. railings... Drg. No. SD/201.
iii) Details of Elastomeric Bearings Drg. No. SD/203
iv) Details of rocker and roller bearings... Drg. No. SD/204.
v) Details of miscellaneous items... Drg. No. SD/205.
vi) Details of deck slab (for bridges without footpaths)... Drg. No. SD/232.
vii) Details of longitudinal girders... Drg. No. SD/234.
viii) Details of cross girders... Drg. No. SD/235.
ix) Schedule of reinforcement... Drg. No. SD/236 Sh.-1 & Sh.-2.

MKD.	DATE	DESCRIPTION	BY
		REVISION	

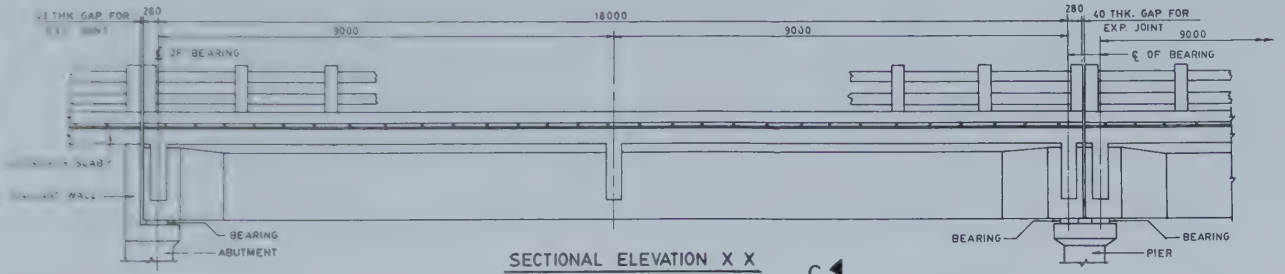
GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
(ROADS WING), NEW DELHI.

STANDARD DRAWINGS FOR ROAD BRIDGES

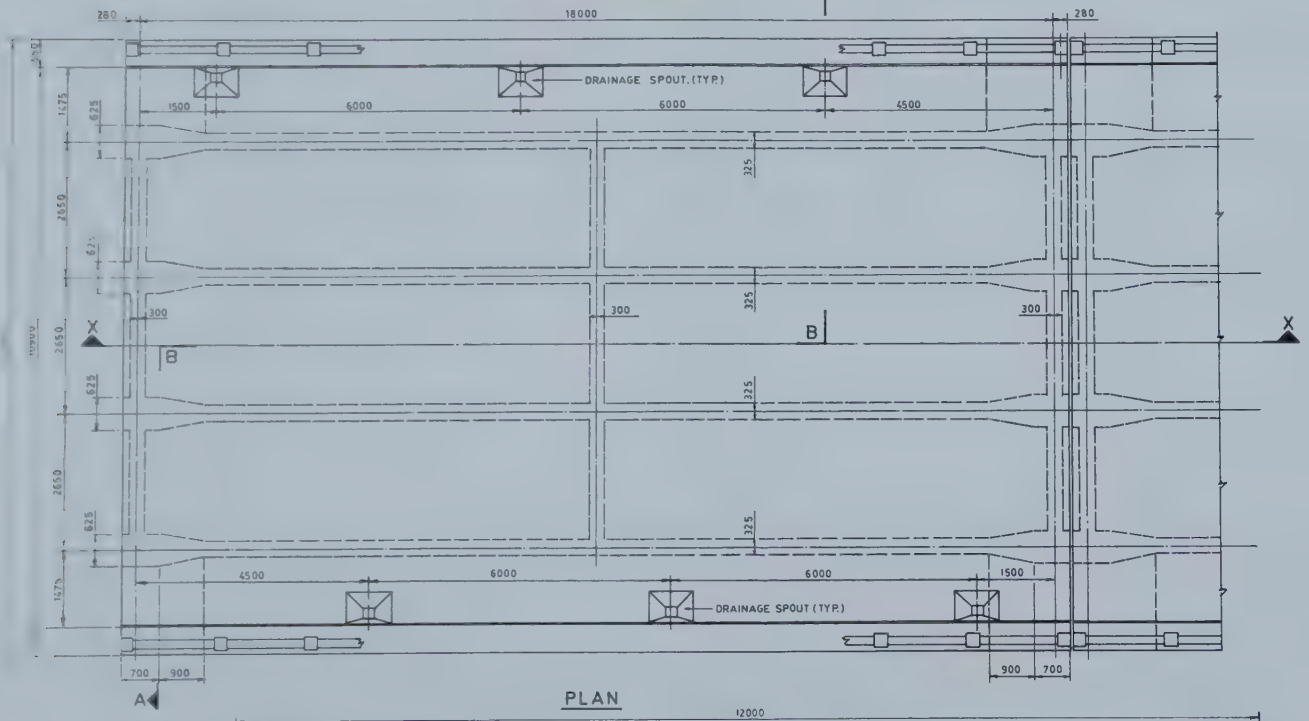
R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE 18·0 M. SPAN WITHOUT FOOTPATHS GENERAL ARRANGEMENT.

RECOMMENDED BY :		APPROVED BY	1991
(M.P. MARWAH) E.E.	(N.K. SINHA) S.E.	(M.K. MUKHERJEE) C.E.	DRG. NO. SD/230

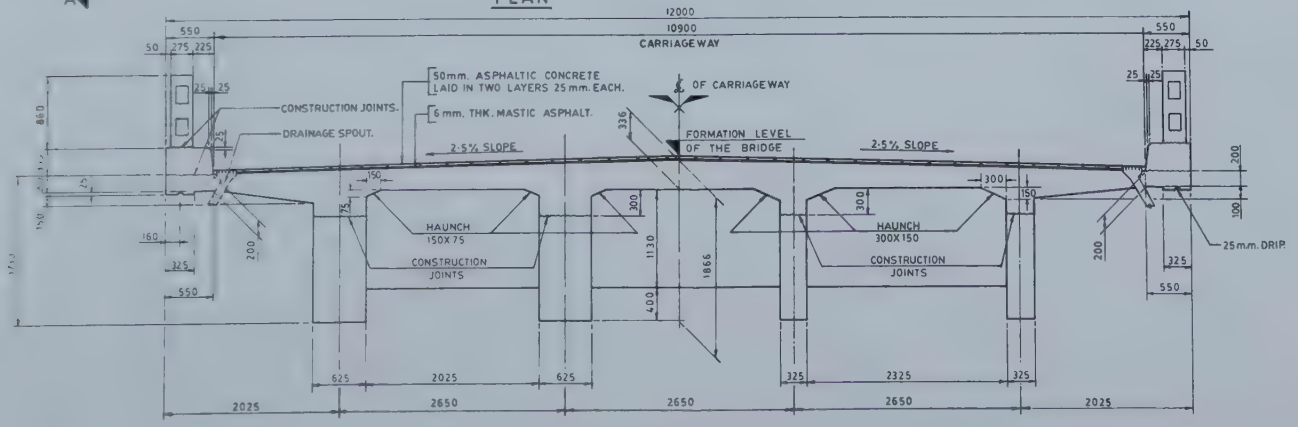
DRG. NO. SD/230



SECTIONAL ELEVATION X X



PLAN



SECTION A B C

NOTES :

This drawing shall be read in conjunction with the following drawings.

i) General notes.. Drg. No. SD/200.
ii) Details of R.C.C. railings..Drg.No. SD/201.
iii) Details of Elastomeric Bearings Drg. No.SD/203
iv) Details of rocker and roller bearings... Drg. No. SD/204.
v) Details of miscellaneous items... Drg. No. SD/205.
vi) Details of deck slab (for bridges without footpaths)... Drg. No. SD/232.
vii) Details of longitudinal girders... Drg. No. SD/234.
viii) Details of cross girders... Drg. No. SD/235.
ix) Schedule of reinforcement ...Drg. No. SD/236 Sh.-1 & Sh.-2.

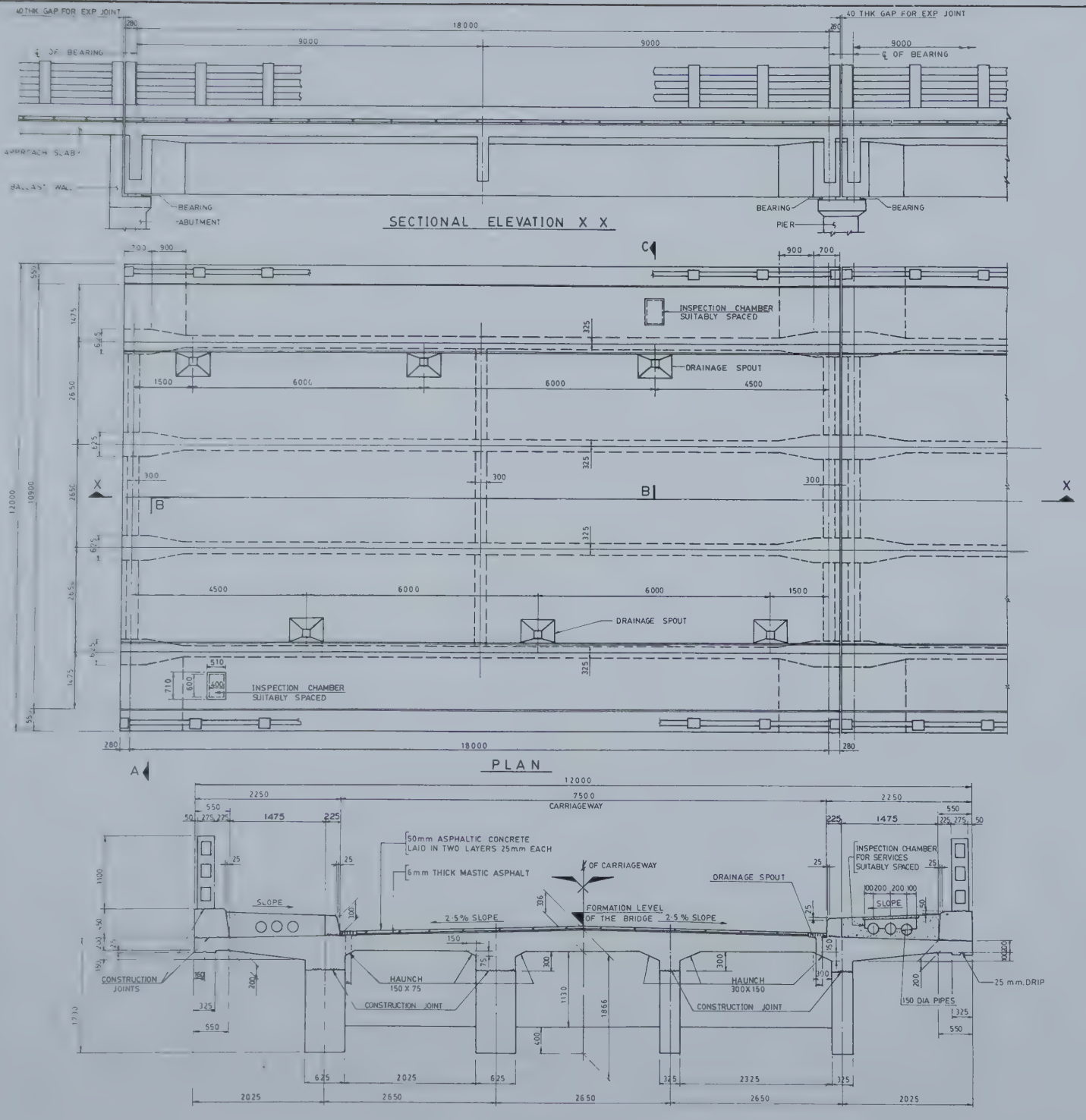
MKD.	DATE	DESCRIPTION	BY
		REVISION	

GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
(ROADS WING), NEW DELHI.

STANDARD DRAWINGS FOR ROAD BRIDGES

R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE 18·0 M. SPAN WITHOUT FOOTPATHS GENERAL ARRANGEMENT.

RECOMMENDED BY :		APPROVED BY	1991
(M.P. MARWAH) E.E	(N.K. SINHA) S.E.	(M.K. MUKHERJEE) C.E.	DRG. NO. SD/230



DRG. NO. SD/231.

NOTES

This drawing shall be read in conjunction with the following drawings.

i) General notes...Drg. No. SD/200.
ii) Details of R.C.C railings...Drg. No. SD/202.
iii) Details of elastomeric bearings...Drg. No. SD/203.
iv) Details of rocker and roller bearings..Drg. No. SD/204.
v) Details of miscellaneous items...Drg. No. SD/205.
vi) Details of deck slab (for bridges with footpaths)... Drg. No. SD/233.
vii) Details longitudinal girders...Drg. No. SD/234.
viii) Details of cross girders:...Drg. No. SD/235.
ix) Schedule of reinforcement...Drg. No. SD/237. Sh-1 & Sh-2.

MKD	DATE	DESCRIPTION	BY
		REVISION.	

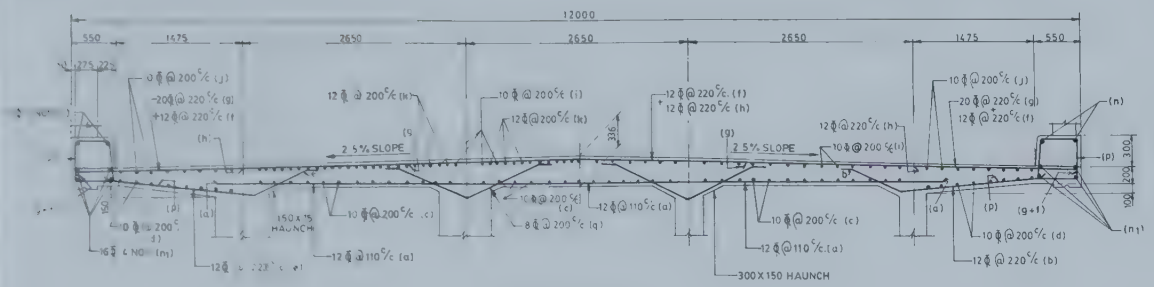
GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
(ROADS WING), NEW DELHI.

STANDARD DRAWINGS FOR ROAD BRIDGES.

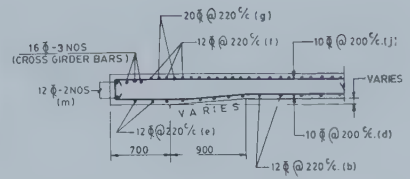
R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE 18·0 M SPAN WITH FOOTPATHS GENERAL ARRANGEMENT

RECOMMENDED BY		APPROVED BY	1991
(M.P. MARWAH). E E	(N.K. SINHA). S.E.	(M.K. MUKHERJEE) C E	DRG. NO. SD/231

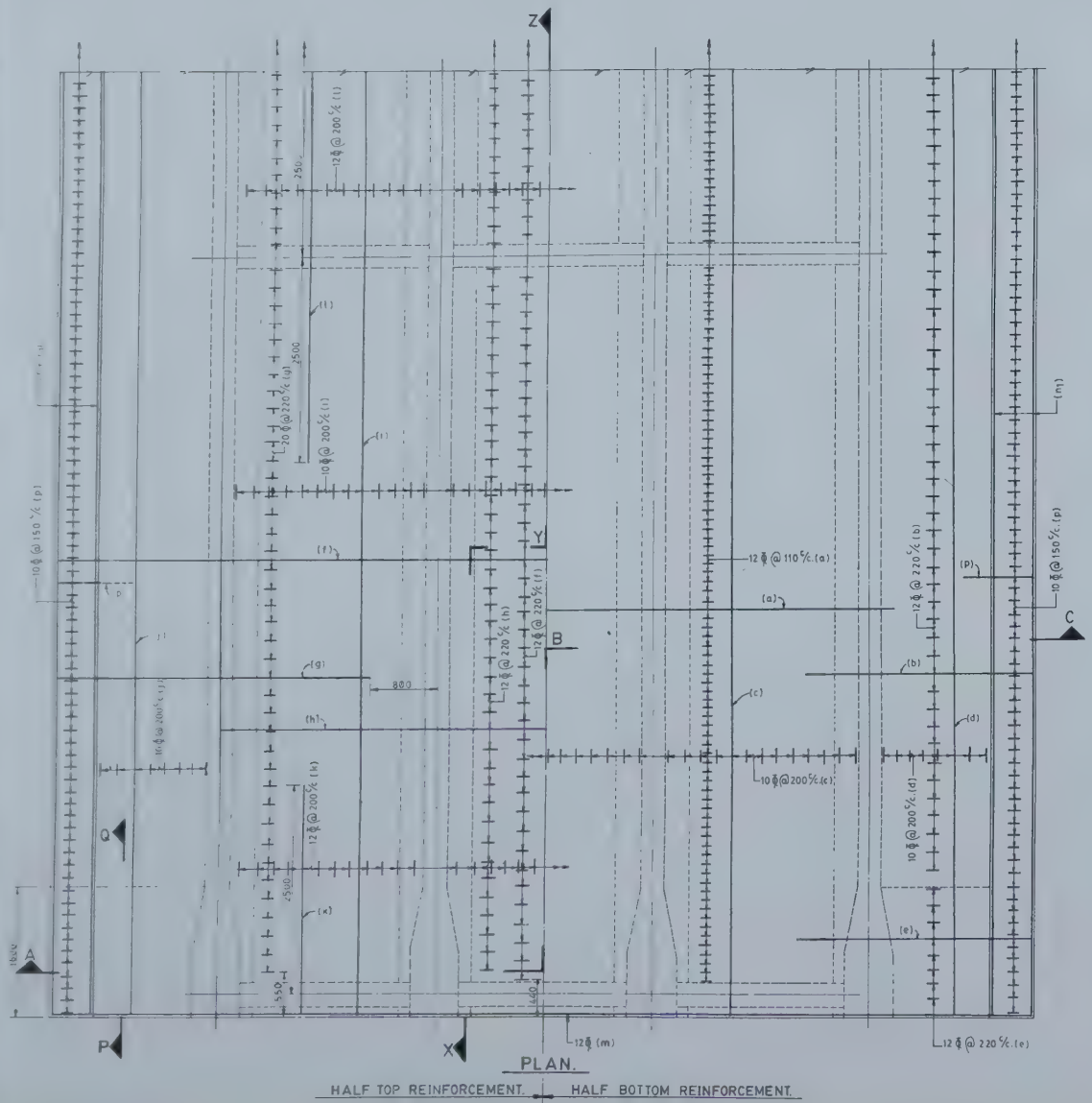
DRG. NO. SD/232.



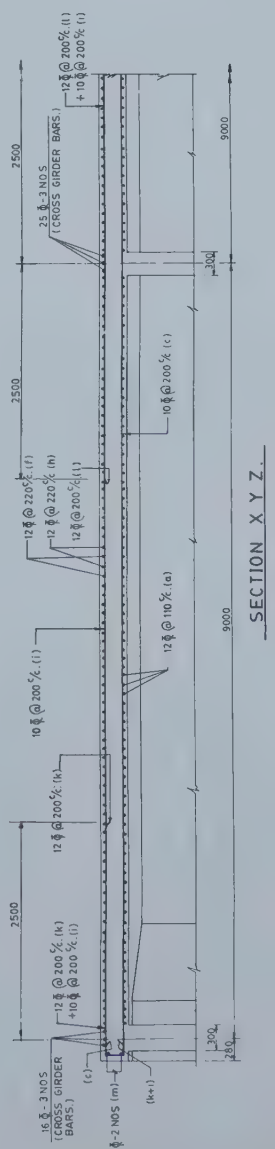
CROSS SECTION A B C.



SECTION P Q.



HALF TOP REINFORCEMENT. HALF BOTTOM REINFORCEMENT.



SECTION X Y Z.

NOTES:

1. The reinforcement for railing posts should be properly anchored in the deck slab before casting the slab.
2. This drawing shall be read in conjunction with the following drawings.
   - i) General notes....Drg. No. SD/200.
   - ii) Details of R.C.C. railing....Drg. No. SD/201.
   - iii) Details of elastomeric bearings....Drg. No. SD/203
   - iv) Details of rocker and roller bearings....Drg. No. SD/204
   - v) Details of miscellaneous items....Drg. No. SD/205.
   - vi) General arrangement. (for bridges without footpaths.) ....Drg. No. SD/230.
   - vii) Details of longitudinal girders....Drg. No. SD/234.
   - viii) Details of cross girders....Drg. No. SD/235.
   - ix) Schedule of reinforcement....Drg. No. SD/236, Sh-1 & Sh-2

MKD	DATE	DESCRIPTION	BY
		REVISION	

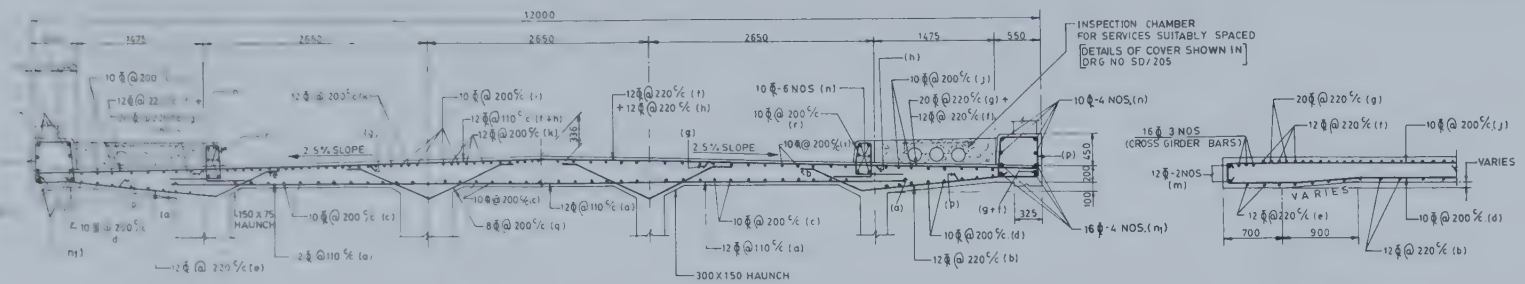
GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
(ROADS WING), NEW DELHI.

STANDARD DRAWINGS FOR ROAD BRIDGES.

R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE 18·0 M SPAN WITHOUT FOOTPATHS DETAILS OF DECK SLAB

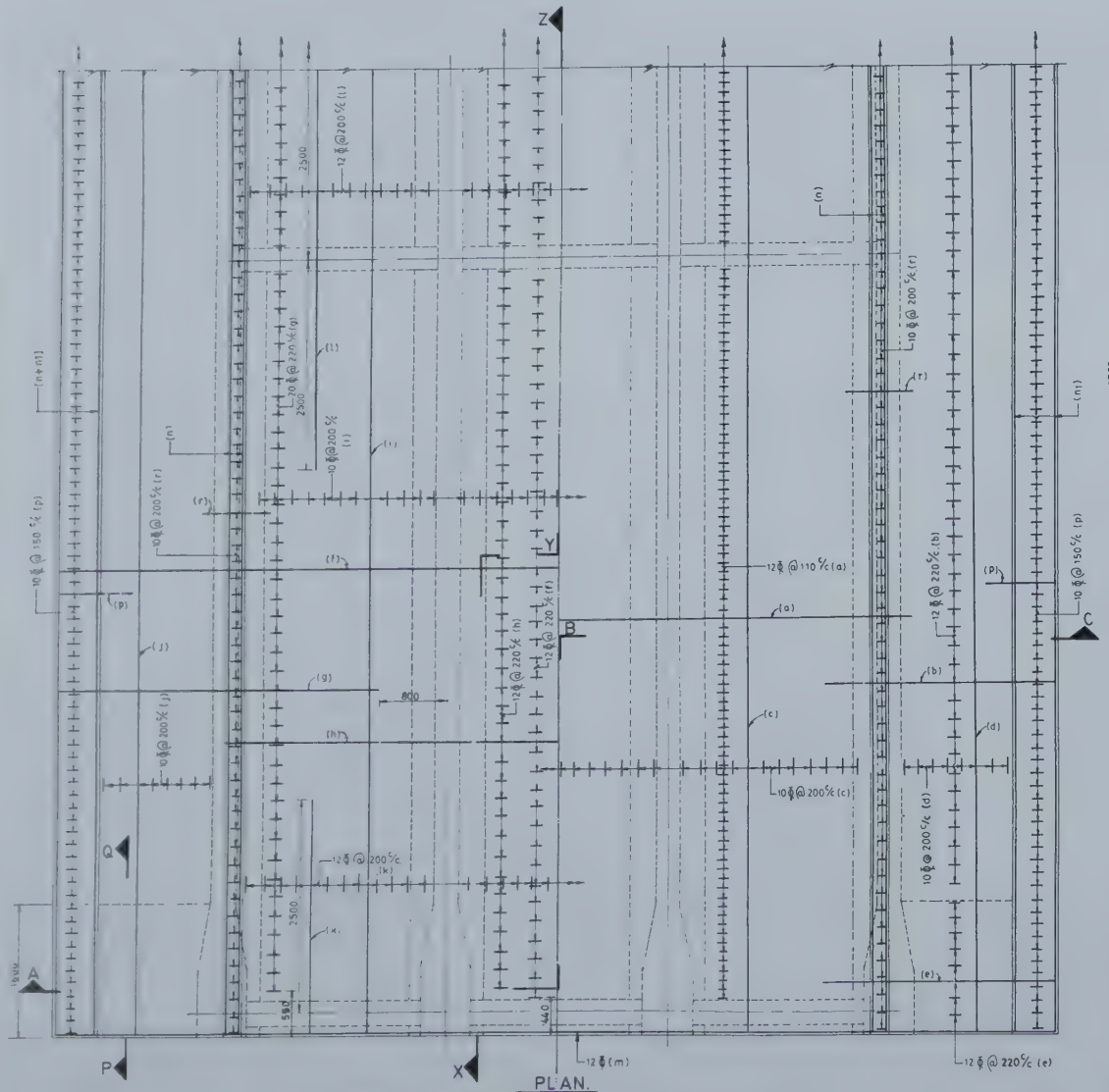
RECOMMENDED BY:		APPROVED BY	1991
(M P MARWAH) E E	(N K SINHA) S E	(M.K MUKHERJEE) C E.	DRG. NO. SD/232

DRG. NO. SD/233.



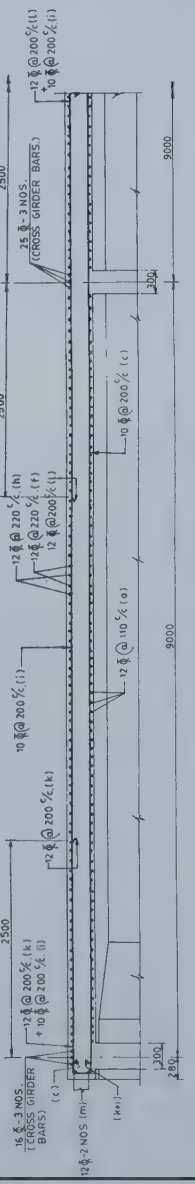
CROSS SECTION A B C.

SECTION P Q.

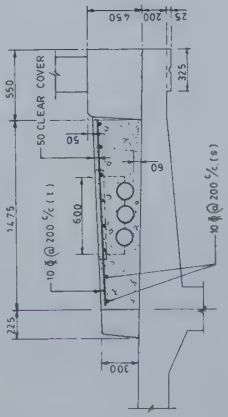


PLAN.

HALF TOP REINFORCEMENT. HALF BOTTOM REINFORCEMENT.



SECTION X Y Z.



DETAILS OF REINFORCEMENT IN FOOTPATH.

NOTES :-

1. The reinforcement for railing post should be properly anchored in the deck slab before casting the slab.
2. This drawing shall be read in conjunction with following drawings.
   - i) General notes.... Drg. No. SD/200.
   - ii) Details of R.C.C. railing.... Drg. No. SD/202.
   - iii) Details of elastomeric bearings.... Drg. No. SD/203.
   - iv) Details of rocker and roller bearings... Drg. No. SD/204.
   - v) Details of miscellaneous items.... Drg. No. SD/205.
   - vi) General arrangement. (for bridges with footpaths).... Drg. No. SD/231.
   - vii) Details of longitudinal girders.... Drg. No. SD/234
   - viii) Details of cross girders.... Drg. No. SD/235.
   - ix) Schedule of reinforcement.... Drg. No. SD/237. Sh-1 & Sh-2.

MKD	DATE	DESCRIPTION	BY
REVISION.			

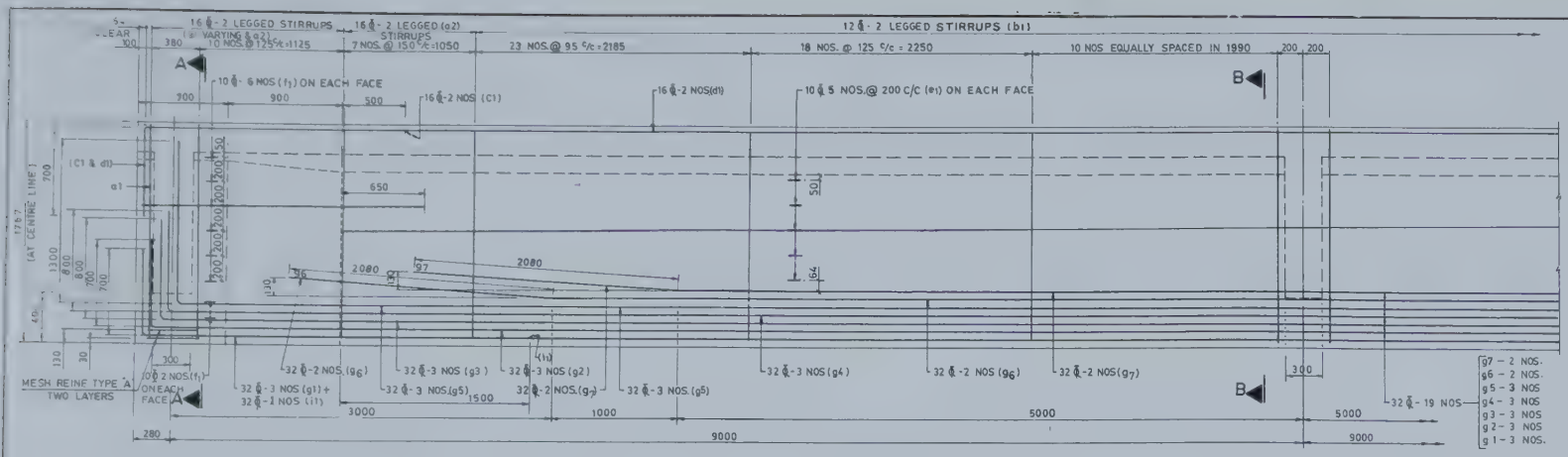
GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
(ROADS WING), NEW DELHI.

STANDARD DRAWINGS FOR ROAD BRIDGES

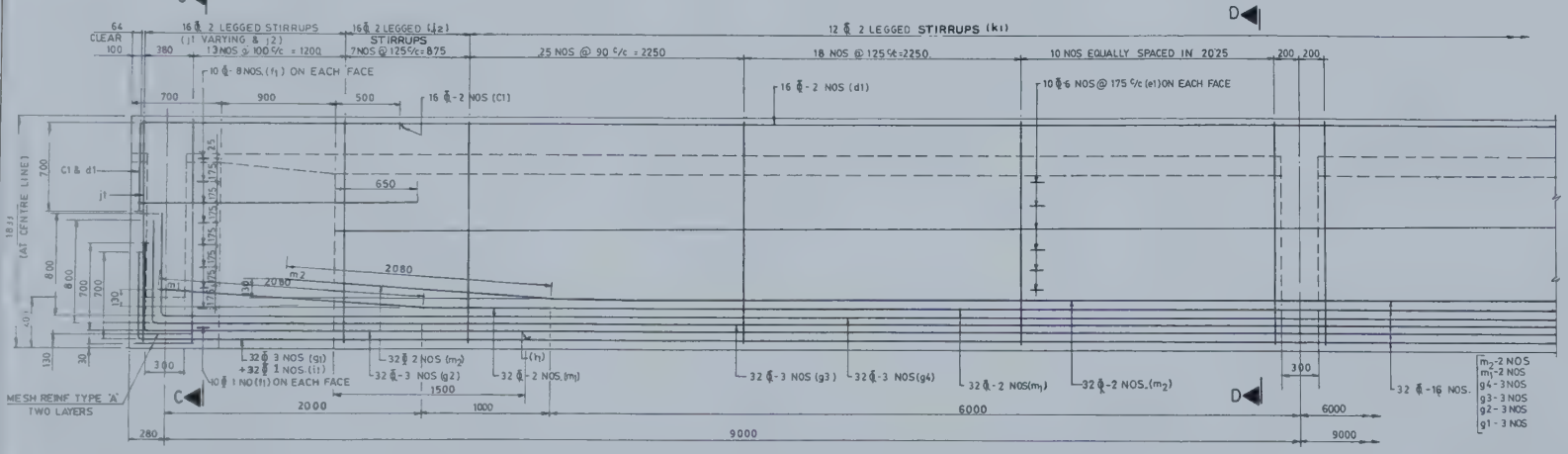
R C C T-BEAM AND SLAB SUPERSTRUCTURE 18·0 M SPAN WITH FOOTPATHS DETAILS OF DECK SLAB

RECOMMENDED BY		APPROVED BY	1991
(M.P MARWAH). EE	(N K SINHA) SE	(M K MUKHERJEE) CE	DRG NO SD/233

DRG. NO SD / 234.


16 ϕ - 2 LEGGED STIRRUPS
16 ϕ - 2 LEGGED (a2) STIRRUPS
12 ϕ - 2 LEGGED STIRRUPS (b1)
10 NOS @ 125 c/c = 1125
7 NOS @ 150 c/c = 1050
23 NOS @ 95 c/c = 2185
18 NOS. @ 125 c/c = 2250
10 NOS EQUALLY SPACED IN 1990
10 ϕ - 6 NOS (f1) ON EACH FACE
16 ϕ - 2 NOS (C1)
16 ϕ - 2 NOS (d1)
10 ϕ 5 NOS. @ 200 C/C (e1) ON EACH FACE
MESH REINF TYPE 'A' TWO LAYERS
10 ϕ 2 NOS (f1) ON EACH FACE
32 ϕ - 2 NOS (g6)
32 ϕ - 3 NOS (g3)
32 ϕ - 3 NOS (g2)
32 ϕ - 3 NOS (g4)
32 ϕ - 2 NOS (g6)
32 ϕ - 2 NOS (g7)
32 ϕ - 3 NOS (g1) + 32 ϕ - 1 NOS (i1)
32 ϕ - 3 NOS (g5)
32 ϕ - 2 NOS. (g7)
32 ϕ - 19 NOS
g7 - 2 NOS.
g6 - 2 NOS.
g5 - 3 NOS
g4 - 3 NOS
g3 - 3 NOS
g2 - 3 NOS
g1 - 3 NOS.
3000
1000
5000
9000

LONGITUDINAL SECTION OF OUTER GIRDER


16 ϕ 2 LEGGED STIRRUPS (j1 VARYING & j2)
16 ϕ 2 LEGGED (k2) STIRRUPS
12 ϕ 2 LEGGED STIRRUPS (k1)
13 NOS @ 100 c/c = 1200
7 NOS @ 125 c/c = 875
25 NOS @ 90 c/c = 2250
18 NOS @ 125 c/c = 2250
10 NOS EQUALLY SPACED IN 2025
10 ϕ - 8 NOS. (f1) ON EACH FACE
16 ϕ - 2 NOS (C1)
16 ϕ - 2 NOS (d1)
10 ϕ 6 NOS @ 175 c/c (e1) ON EACH FACE
MESH REINF TYPE 'A' TWO LAYERS
10 ϕ 1 NO (f1) ON EACH FACE
32 ϕ 3 NOS (g1) + 32 ϕ 1 NOS (i1)
32 ϕ 2 NOS (m2)
32 ϕ - 3 NOS (g2)
32 ϕ - 2 NOS (m1)
32 ϕ - 3 NOS (g3)
32 ϕ - 3 NOS (g4)
32 ϕ - 2 NOS (m1)
32 ϕ - 2 NOS. (m2)
32 ϕ - 16 NOS.
m2 - 2 NOS
m1 - 2 NOS
g4 - 3 NOS
g3 - 3 NOS
g2 - 3 NOS
g1 - 3 NOS
2000
1000
6000
9000

LONGITUDINAL SECTION OF INNER GIRDER.

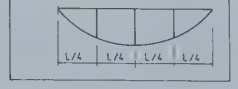
NOTES

1. Longitudinal girders shall be given upward camber on account of dead load deflection as given in the table -I.
2. 32 ϕ spacer bars shall be provided @ 1 m c/c. between two tiers of longitudinal bars of girders.
3. This drawing shall be read in conjunction with the following drawings.

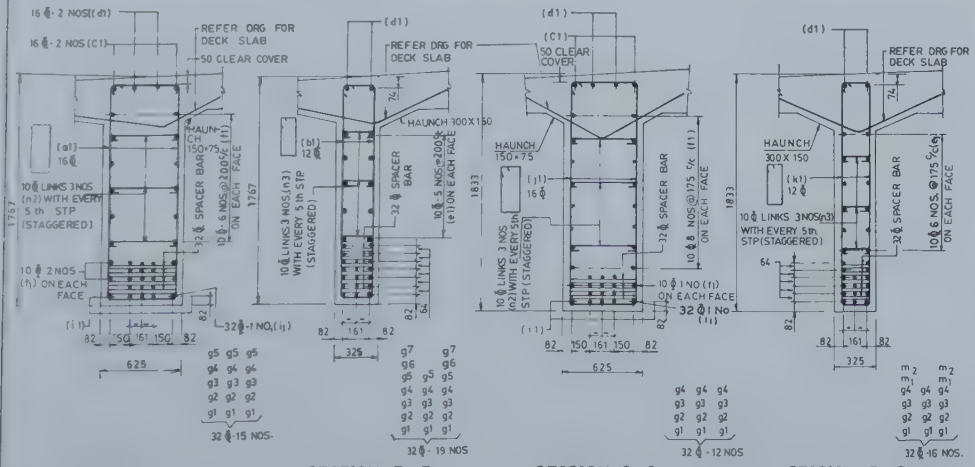
i) General notes ...Drg. No. SD / 200.
ii) Details of elastomeric bearing...Drg. No. SD / 203.
iii) Details of rocker and roller bearing...Drg. No. SD / 204.
iv) General arrangement (for bridges without footpaths)... Drg. No. SD / 230.
v) General arrangement (for bridges with footpaths)... Drg No SD / 231.
vi) Details of deck slab (for bridges without footpaths)... Drg. No. SD / 232.
vii) Details of deck slab (for bridges with footpaths)... Drg. No. SD / 233.
viii) Details of cross girders ...Drg. No. SD / 235.
ix) Schedule of reinforcement (for bridges without footpaths) ...Drg. No. SD / 236. Sh -1 & Sh -2.
x) Schedule of reinforcement (for bridges with footpaths)... Drg No SD / 237. Sh -1 & Sh -2.

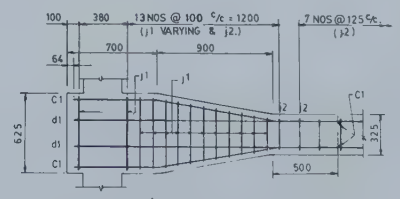
TABLE-I

	1/4 POINT	MID SPAN	1/4 POINT
BRIDGE WITH F P	9·5 m.m.	14 m. m.	9·5 m.m.
BRIDGE WITH-OUT F P	8 m.m.	12 m m.	8 m.m

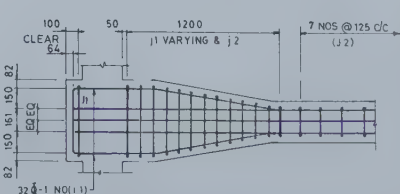


DEAD LOAD DEFLECTION DIAGRAM

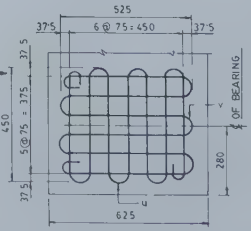

REFER DRG FOR DECK SLAB
50 CLEAR COVER
HAUNCH 300X150
HAUNCH 150×75
32 ϕ SPACER BAR
10 ϕ LINKS 3 NOS (n2) WITH EVERY 5th STP (STAGGERED)
10 ϕ 6 NOS @ 200 c/c (e1) ON EACH FACE
10 ϕ 8 NOS @ 175 c/c (f1) ON EACH FACE
10 ϕ 2 NOS (f1) ON EACH FACE
32 ϕ - 1 NO (i1)
32 ϕ - 15 NOS.
32 ϕ - 19 NOS
32 ϕ - 12 NOS
32 ϕ - 16 NOS.
SECTION A-A
SECTION B-B
SECTION C-C
(m1 BARS NOT SHOWN)
SECTION D-D



(INNER GIRDER)
PLAN SHOWING WEB REINF.(TOP) AT THE END



(INNER GIRDER)
PLAN SHOWING WEB REINF (BOTTOM) AT THE END
(SIMILAR SCHEME OF DETAILING WILL BE FOLLOWED FOR OUTER GIRDERS)



8 ϕ MESH REINFORCEMENT TYPE - 'A'

MKD	DATE	DESCRIPTION	BY
		REVISION	

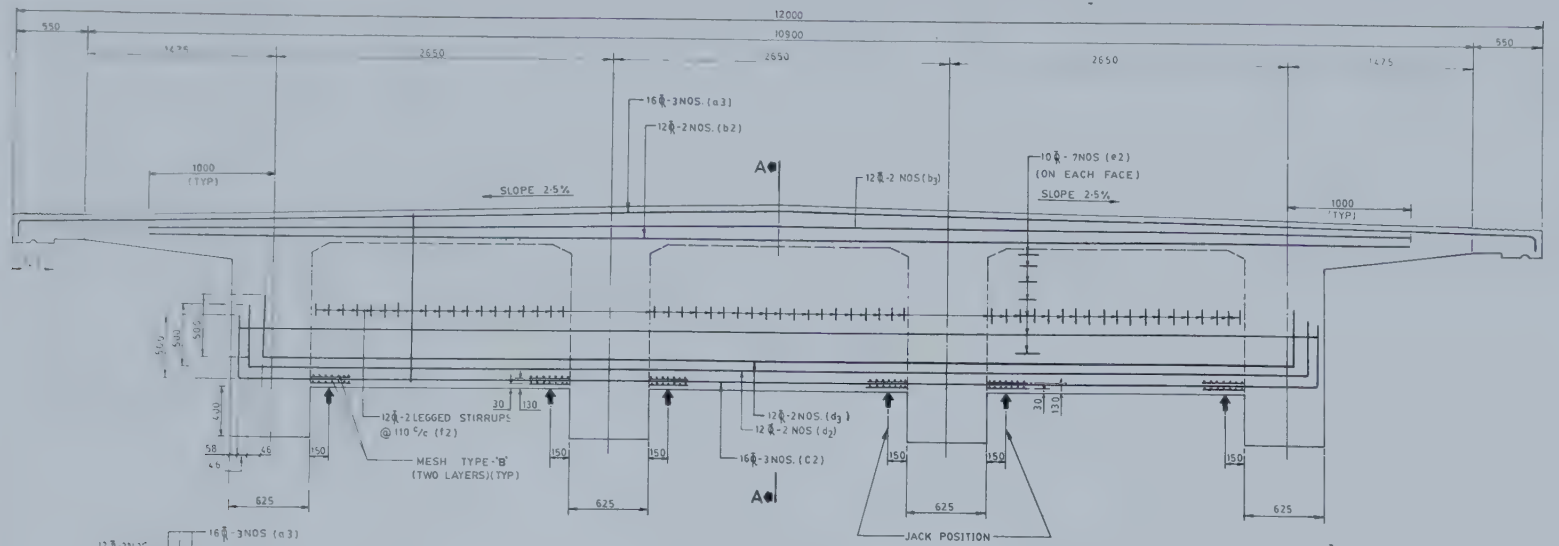
GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
(ROADS WING), NEW DELHI.

STANDARD DRAWINGS FOR ROAD BRIDGES

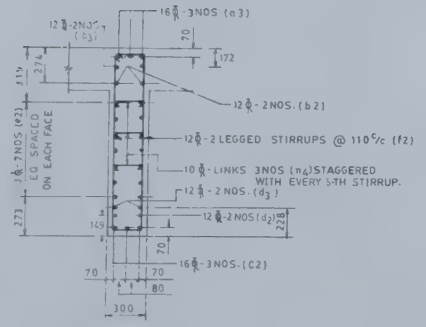
R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE 18·0M SPAN WITH & WITHOUT FOOTPATHS DETAILS OF LONGITUDINAL GIRDERS

RECOMMENDED BY		APPROVED BY:	1991
(M. P. MARWAH) E E	(N.K SINHA) S E	(M.K. MUKHERJEE) C.E	DRG. NO. SD/ 234

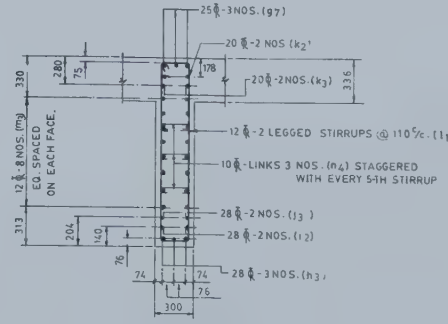
DRG. NO. SD/235



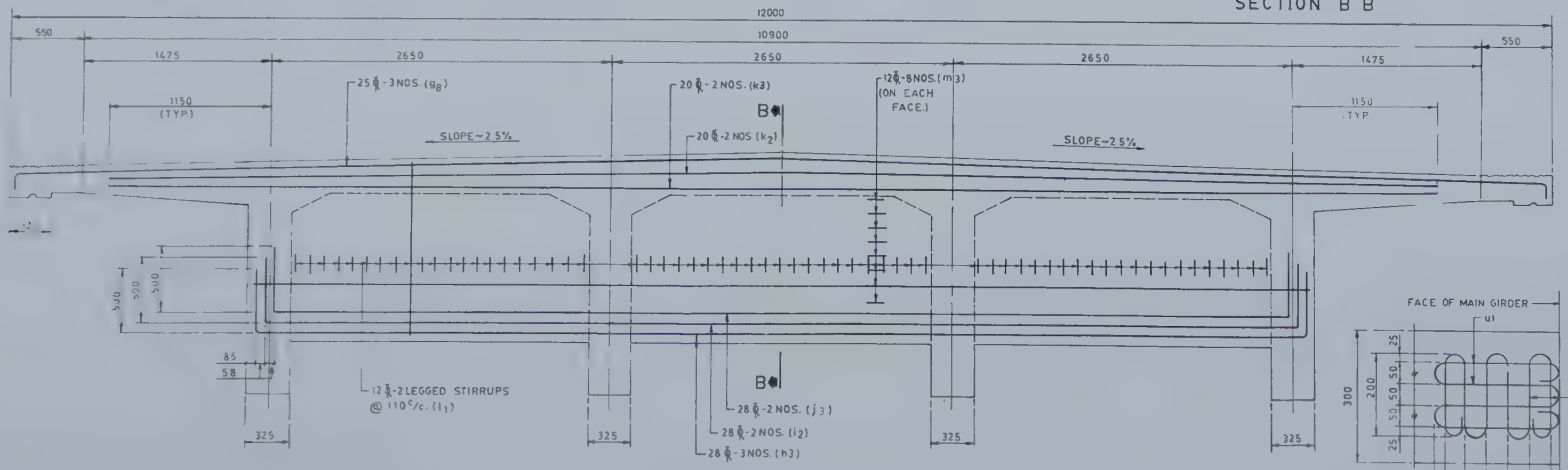
LONGITUDINAL SECTION OF END CROSS GIRDER



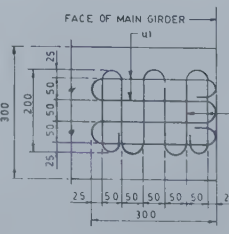
SECTION A A



SECTION B B



LONGITUDINAL SECTION OF INTERMEDIATE CROSS GIRDER



8ϕ MESH REINFORCEMENTS TYPE-'B'

NOTES -

1. The location of jacks for lifting of the superstructure to replace bearings etc. is shown thus ⬆. This shall be distinctly etched for easy identification on the end cross girders and pier / abutment caps.
2. During the lifting operation, all the six jacks placed under the end cross-girder in line with the bearings shall be operated simultaneously using single operating console, grouping the pump and control system, so as to ensure that the reactions on all the six jacks are equal at all times.
3. Capacity of each jack shall not be less than 32 Tons.
4. This drawing shall be read in conjunction with the following drawings.

i) General notes... Drg. No. SD/200
ii) Details of elastomeric bearings... Drg. No. SD/203
iii) Details of rocker and roller bearings... Drg. No. SD/204
iv) General arrangement (for bridges without foot paths.)... Drg. No. SD/230
v) General arrangement (for bridges with foot paths.).. Drg. No. SD/231
vi) Details of deck slab (for bridges without footpaths.). Drg. No. SD/232
vii) Details of deck slab (for bridges with footpaths.)... Drg. No. SD/233
viii) Details of longitudinal girders... Drg. No. SD/234
ix) Schedule of reinforcement (for bridges without footpaths) Drg. No. SD/236 Sh-1 & Sh-2
x) Schedule of reinforcement (for bridges with footpaths.)... Drg. No. SD/237 Sh-1 & Sh-2.

MKD	DATE	DESCRIPTION	BY
		REVISION.	

GOVERNMENT OF INDIA.
MINISTRY OF SURFACE TRANSPORT.
(ROADS WING), NEW DELHI.

STANDARD DRAWINGS FOR ROAD BRIDGES.

R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE. 18·0 M. SPAN WITH AND WITHOUT FOOTPATHS. DETAILS OF CROSS GIRDERS.

RECOMMENDED BY		APPROVED BY:	1991 :
(M P MARWAH). E E	(N.K SINHA) S.E	(M.K.MUKHERJEE) C E	DRG. NO SD/235

DRG.NO.SD/236-Sh-1

SCHEDULE OF REINFORCEMENT (PER SPAN)

A) H.Y.S.D. BARS

Sl No	Type of bars	Shape of bars (not to scale) (dimensions are in millimetres)	Dia of bars (mm.)	Length of each bar (mm)	No of bars	Total length (m.)	Weight (kg.)
		Slab					
1	a	8575	12	8575	160	1372·00	1234·8
2	b	150, 530, R=120, 1692, 500, R=120, 140, 249, 137	12	2976	138	410·69	369·62
3	c	150, L, 150, L, 18460, L= Varying from 109 to 212.	10	18960	39	739·44	443·66
4	d	140, L, 15360, R=100, 140, 901, Varying from R=100 0 to 70, 901, L, 650, 650, L= Varying from 68 to 270	10	18960	16	303·36	182·02
5	e	150, Varying from 530 to 700, R=120, Varying from 1543 to 1692, 500, R=120, 140, Varying from 249 to 332, varying from 137 to 198	12	2987	32	95·58	86·02
6	f	5952, 5952, R=120, 25, 75, 149	12	12054	80	964·32	867·89
7	g	3826, 120, 96	20	3946	160	631·36	1578·4
8	h	3976, 3976, R=120, 99	12	7952	80	636·16	572·54
9	i	18460, L, 150, 150, L, L= Varying from 109 to 212	10	18960	39	739·44	443·66
10	j	18460, L, 75, 75, L, L= Varying from 68 to 270	10	18888	16	302·21	181·33
11	k	2730, L, 170, L= Varying from 109 to 212	12	2988	72	215·14	193·63
12	l	5000	12	5000	36	180·00	162·00
13	m	11900	12	11900	4	47·60	42·84
14	n	18460	10	18460	4	73·84	44·30
15	n_1	18460	16	18460	8	147·68	236·29
16	p	405, 380, 380, 443, 500, Varying from 37 to 54	10	2208	248	547·58	328·55
17	q	150, R=80, 150, 393, 860, 950, R=80, 433	8	2110	180	379·80	151·92
		Longitudinal girders					
1	a_1	L_1=Varying from 1629 to 1633, L_2=Varying from 1637 to 1641, Varying from 193 to 493	16	4276	44	188·14	301·02
-	a_2	193, 1633, 1637, 193	16	3976	28	111·33	178·13
3	b_1	193, 1633, 1637, 193	12	3896	204	794·78	715·30
4	c_1	708, R=96, Elevation, 166, 636, 913, 500, Plan	16	2693	16	43·09	68·94
5	d_1	18432, 708, R=96, 708	16	19720	8	157·76	252·42
6	e_1	15360	10	15360	44	675·84	405·50
7	f_1	160, 650, 636, 913	10	2199	136	299·06	179·44

Sl. No	Type of bars	Shape of bars (not to scale) (dimensions are in millimetres)	Dia of bars (mm)	Length of each bar (m.m.)	No of bars	Total length (m.)	Weight (kg)
8	g_1	716, R=192, 716, 18432	32	19608	12	235·30	1482·39
9	g_2	716, R=192, 716, 18304	32	19480	12	233·76	1472·69
10	g_3	816, R=192, 816, 18176	32	19552	12	234·62	1478·11
11	g_4	816, R=192, 816, 18048	32	19424	12	233·09	1468·47
12	g_5	1300, R=192, 1300, 17920	32	20264	6	121·58	765·95
13	g_6	2080, 12000, 2080, 162	32	16160	4	64·64	407·23
14	g_7	2080, 10000, 2080, 162	32	14160	4	56·64	356·83
15	l_1	636, 913, 1500, R=192, 493, R=192, 193, 636, 913, 1500	32	6335	8	50·68	319·28
16	j_1	L_1=Varying from 1703 to 1707, L_2=Varying from 1699 to 1695, Varying from 193 to 493	16	4408	56	246·85	394·96
17	j_2	193, 1699, 1703, 193	16	4108	28	115·02	184·03
18	k_1	193, 1699, 1703, 193	12	4028	212	853·94	768·54
19	h_1	2080, 14000, 2080, 162	32	18160	4	72·64	457·63
20	h_2	2080, 12000, 2080, 162	32	16160	4	64·64	407·23
21	n_2	140, L, 140, L= Varying from 213 to 513.	10	583	84	48·97	29·38
22	n_3	140, 213, 140	10	433	288	124·70	74·82

B) M.S. BARS.(MESH REINFORCEMENT IN LONGITUDINAL GIRDERS)

1	u	25, 375, 37·5, 30, 30, 375, 375, 25, 75 75 75 75 75	8	3550	16	56·80	22·72
2	v	30, 25, 75, 75, 75, 75, 75, 30, 37·5, 450, 25	8	35·06	16	56·10	22·44

NOTES

1. Dimensions in the schedule are given as per IS: 2502-1963.
2. The exact length of the bars will be determined by the actual laps with splices adopted at site.
3. This drawing shall be read in conjunction with following drawings
   - i) General notes...Drg. No. SD/200.
   - ii) Details of deck slab (for bridges without footpath) Drg. No. SD/232.
   - iii) Details of longitudinal girders....Drg. No. SD/234.

MKD	DATE	DESCRIPTION	BY
		REVISION	

GOVERNMENT OF INDIA.
MINISTRY OF SURFACE TRANSPORT
(ROADS WING), NEW DELHI

STANDARD DRAWINGS FOR ROAD BRIDGES

R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE.
18·0M SPAN WITHOUT FOOTPATHS
SCHEDULE OF REINFORCEMENT.

RECOMMENDED BY		APPROVED BY	1991
(M P MARWAH) E.E.	(N K SINHA) S.E	(M.K. MUKHERJEE) C.E	DRG. NO. SD/236 Sh-1.

DRG.NO. SD/236-Sh-2

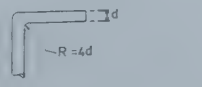
SCHEDULE OF REINFORCEMENT (PER SPAN)

A) H.Y.S.D. BARS.

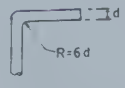
Sl No	Type of bars	Shape of bars (not to scale) (dimensions are in millimetres)	Dia of bars (mm)	Length of each bar (m m)	No of bars	Total length (m)	Weight (kg)
		Cross Girders.					
1	a_1	5952, 5952, R=160, 95, 95, 1152	16	12094	6	72·56	116·10
2	b_2	9950	12	9950	4	39·80	35·82
3	b_3	9950	12	9950	4	39·80	35·82
4	c_2	R=64, 508, 8475, 508	16	9395	6	56·37	90·19
5	d_2	R=48, 506, 8379, 506	12	9319	4	37·28	33·55
6	d_3	R=48, 506, 8287, 506	12	9227	4	36·91	33·22
7	e_2	R=40, 106, 8443, 106	10	8595	28	240·66	144·40
8	f_2	L=varying from1250to1342. 176	12	3184	114	362·98	326·68
9	g_8	5952, 5952, R=250, 100, 100, 1161	25	12204	3	36·61	139·13
10	h_3	R=168, 514, 8131, 514	28	8935	3	26·81	128·69
11	i_2	R=168, 514, 8015, 514	28	8819	2	17·64	84·67
12	j_3	R=168, 514, 7899, 514	28	8703	2	17·41	83·57
13	k_2	10250	20	10250	2	20·50	51·25
14	k_3	10250	20	10250	2	20·50	51·25
15	l_1	L=varying from1248to1342 176	12	3182	63	200·47	180·42
16	m_1	R=48, 529, 8151, 529	12	9137	16	146·19	131·57
17	n_1	140, 196, 140	10	416	135	56·16	33·70

B) M.S. BARS. (MESH REINFORCEMENT IN CROSS GIRDERS)

18	u_1	30, 30, 50, 50, 50, 25, 250, 25	8	1453	24	34·87	13·95
19	v_1	30, 30, 30, 25, 150, 25, 50 50 50 50 50	8	1510	24	36·24	14·50



d = Dia of bar
For bar upto 25mm dia.



d = Dia of bar
For bar above 25 mm dia.

MAXIMUM DEAD LOAD REACTIONS (in K.N)

At Abutment	At pier
1662	3324

TOTAL QUANTITY *(PER SPAN)

1 STEEL 22·04 T H.Y.S.D BARS
0·08 T M.S BARS
(including 5% extra for laps and wastage)

2 (i) CONCRETE 116·93 m^3

* Excluding quantities for railing

NOTES

1 Dimensions in the schedule are given as per IS: 2502 - 1963.

2 The exact length of the bars will be determined by the actual laps/splices adopted at site.

3 This drawing shall be read in conjunction with following drawings

i) General notes Drg.No SD/200.

ii) Details of cross girders Drg No SD/235.

iii) Schedule of reinforcement Drg No SD/236-Sh-1.

MKD	DATE	DESCRIPTION	BY
		REVISION	

GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
(ROADS WING), NEW DELHI

STANDARD DRAWINGS FOR ROAD BRIDGES

R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE
18·0 M SPAN WITHOUT FOOTPATHS
SCHEDULE OF REINFORCEMENT

RECOMMENDED BY		APPROVED BY	1991
(M P. MARWAH) E.E.	(N.K. SINHA) S.E.	(M K. MUKHERJEE) C.E	DRG. NO. SD/236-Sh-2

DRG. NO. SD/237-Sh-1

SCHEDULE OF REINFORCEMENT (PER SPAN)

A) H.Y.S.D. BARS.

Sl. No.	Type of bars.	Shape of bars (not to scale) (dimensions are in millimetres.)	Dia of bars. (m.m.)	Length of each bar. (m.m.)	No of bars.	Total length (m.)	Weight (kg.)
		Slab/ Footpath					
1	a	8575	12	8575	160	1372·00	1234·8
2	b	530, 1692, R=120, 500, 140, 137	12	2976	138	410·69	369·62
3	c	150, 18460, L = Varying from 109 to 212	10	18960	37	701·52	420·91
4	d	140, 15360, 901, R=100 0 to 70, 650, L = Varying from 68 to 270	10	18960	16	303·36	182·02
5	e	150, 530, Varying from 700, 1543, 1692, R=120, 500, 140, Varying from 137 to 198	12	2987	32	95·58	86·02
6	f	5952, 5952, R=120, 149	12	12054	80	964·32	867·89
7	g	3826, 120, 96	20	3946	160	631·36	1578·4
8	h	3976, 3976, R=120, 99	12	7952	80	636·16	572·54
9	i	18460, 150, 150, L = Varying from 109 to 212.	10	18960	37	701·52	420·91
10	j	18460, 75, 75, L = Varying from 68 to 270	10	18888	16	302·21	181·33
11	k	2730, 170, L = Varying from 109 to 212.	12	2988	72	215·14	193·63
12	l	5000	12	5000	36	180·00	162·00
13	m	11900	12	11900	4	47·60	42·84
14	n	18460	10	18460	20	369·20	221·52
15	n_1	18460	16	18460	8	147·68	236·29
16	o	405, 530, 530, 438, 500, Varying from 37 to 54	10	2503	248	620·74	372·44
17	q	150, R=80, 150, 860, 950, R=80, 393, 233	8	2110	180	379·8	151·92
18	r	80, 390, 390, 500, 500	10	1860	186	345·96	207·58
19	s	18460	10	18460	16	295·36	177·22
20	t	1400	10	1400	186	260·40	156·24
		Longitudinal girders					
1	a_1	L_1= Varying from 1629 to 1633, L_2* Varying from 1637 to 1641, Varying from 193 to 493	16	4276	44	188·14	301·02
2	a_2	193, 1633, 1637, 193	16	3976	28	111·33	178·13
3	b_1	193, 1633, 1637, 193	12	3896	204	794·78	715·30
4	c_1	208, R=96, Elevation, 166, 636, 913, 500, Plan	16	2693	16	43·09	68·94
5	d_1	18432, 708, R = 96, 708	16	19720	8	157·76	252·42
6	e_1	15360	10	15360	44	675·84	405·50
7	f_1	160, 636, 913, 650	10	2199	136	299·06	179·44
8	g_1	716, R = 192, 716, 18432	32	19608	12	235·30	1482·39
9	g_2	716, R = 192, 716, 18304	32	19480	12	233·76	1472·69
10	g_3	816, R = 192, 816, 18176	32	19552	12	234·62	1478·11
11	g_4	816, R=192, 816, 18048	32	19424	12	233·09	1468·47
12	g_5	1300, R=192, 1300, 17920	32	20264	6	121·58	765·95
13	g_6	2080, 12000, 2080, 162	32	16160	4	64·64	407·23
14	g_7	2080, 10,000, 2080, 162	32	14160	4	56·64	356·83
15	i_1	636, 913, 1500, 493, R=192, 193, 636, 913, 1500	32	6335	8	50·68	319·28
16	j_1	L_2* Varying from 1699 to 1695, L_1=Varying from 1703 to 1707, Varying from 193 to 493	16	4408	56	246·85	394·96
17	j_2	193, 1699, 1703, 193	16	4108	28	115·02	184·03
18	k_1	193, 1699, 1703, 193	12	4028	212	853·94	768·54
19	m_1	2080, 14000, 2080, 162	32	18160	4	72·64	457·63
20	m_2	2080, 12000, 2080, 162	32	16160	4	64·64	407·23
21	n_2	L, 140, 140, L= Varying from 213 to 513	10	583	84	48·97	29·38
22	n_3	213, 140, 140	10	433	288	124·70	74·82

B) M.S. BARS.(MESH REINFORCEMENT IN LONGITUDINAL GIRDERS)

Sl. No.	Type of bars.	Shape of bars. (not to scale) (dimensions are in millimetres)	Dia of bars. (m.m.)	Length of each bar. (m.m.)	No of bars.	Total length. (m)	Weight. (kg.)
1	u	25, 375, 30, 30, 375, 25, 37·5, 75, 75, 75, 75, 75, 75	8	3550	16	56·80	22·72
2	v	30, 25, 75, 75, 75, 75, 75, 30, 375, 450, 25	8	3506	16	56·10	22·44

NOTES

1. Dimensions in the schedule are given as per IS: 2502-1963.
2. The exact length of the bars will be determined by the actual laps with splices adopted at site.
3. This drawing shall be read in conjunction with following drawings
   - i) General notes··· Drg. No.-SD/200.
   - ii) Details of deck slab (for bridges with footpaths)··· Drg. No.-SD/233.
   - iii) Details of longitudinal girders··· Drg. No.-SD/234.

MKD	DATE	DESCRIPTION	BY
		REVISION	

GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
(ROADS WING) NEW DELHI

STANDARD DRAWINGS FOR ROAD BRIDGES

R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE
18·0 M. SPAN WITH FOOTPATHS
SCHEDULE OF REINFORCEMENT

RECOMMENDED BY:		APPROVED BY	1991
(M P MARWAH) E E	(N K SINHA) S E	(M K MUKHERJEE) C E	DRG. NO SD/237-Sh-1

DRG NO. SD/237-Sh-2

SCHEDULE OF REINFORCEMENT (PER SPAN)

A) H.Y.S.D. BARS.

Sl. No.	Type of bars.	Shape of bars (not to scale) (dimensions are in millimetres)	Dia of bars (m.m.)	Length of each bar (m.m.)	No. of bars	Total length (m.)	Weight (kg)
		Cross Girders					
1	a_3	95, 5952, R=160, 5952, 95, 152	16	12094	6	72·56	116·10
2	b_2	9950	12	9950	4	39·80	35·82
3	b_3	9950	12	9950	4	39·80	35·82
4	c_2	508, R=64, 508, 8475	16	9395	6	56·37	90·19
5	d_2	506, R=48, 506, 8379	12	9319	4	37·28	33·55
6	d_3	506, R=48, 506, 8287	12	9227	4	36·91	33·22
7	e_2	106, R=40, 106, 8443	10	8595	28	240·66	144·40
8	f_2	Varying from 1250 to 1342, 176	12	3184	114	362·98	326·68
9	g_8	100, 5952, R=250, 5952, 100, 161	25	12204	3	36·61	139·13
10	h_3	514, R=168, 514, 8131	28	8935	3	26·81	128·69
11	i_2	514, R=168, 514, 8015	28	8819	2	17·64	84·67
12	j_3	514, R=168, 514, 7899	28	8703	2	17·41	83·57
13	k_2	10250	20	10250	2	20·50	51·25
14	k_3	10250	20	10250	2	20·50	51·25
15	l_1	Varying from 1248 to 1342, 176	12	3182	63	200·47	180·42
16	m_3	529, R=48, 529, 8151	12	9137	16	146·19	131·57
17	n_4	140, 140, 196	10	416	135	56·16	33·70

B) M.S. BARS (MESH REINFORCEMENT IN CROSS GIRDERS)

18	u_1	30 + +, 30 + +, 50, 50, 50, 25, 250, 25	8	1453	24	34·87	13·95
19	v_1	30 + +, 30 + +, 25, 150, 25, +50+50+50+50+50+	8	1510	24	36·24	14·50

R = 4d, d = Dia of bar — For bar upto 25mm dia.

R = 6d, d = Dia of bar — For bar above 25mm dia.

MAXIMUM DEAD LOAD REACTIONS (in K.N)

At Abutment	At Pier
1900	3799

TOTAL QUANTITY* (PER SPAN)

1 STEEL ··· ··· 22·79 T H.Y.S.D. BARS.
0·08 T M.S BARS.
(including 5% extra for laps and wastage)

2 (i) CONCRETE ··· ··· 139·74 m^3.

* Excluding quantities for railing.

NOTES

1. Dimensions in the schedule are given as per IS: 2502-1963.
2. The exact length of the bars will be determined by the actual laps/splices adopted at site.
3. This drawing shall be read in conjunction with following drawings.
   i) General notes Drg. No.. SD/200
   ii) Details of cross girders Drg. No. SD/235.
   iii) Schedule of reinforcement .. Drg. No. SD/237 SH-1.

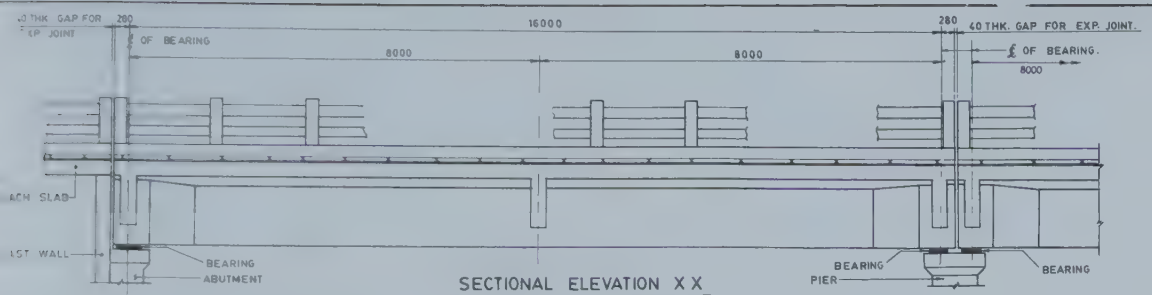
MKD	DATE	DESCRIPTION	BY
		REVISION	

GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
(ROADS WING), NEW DELHI

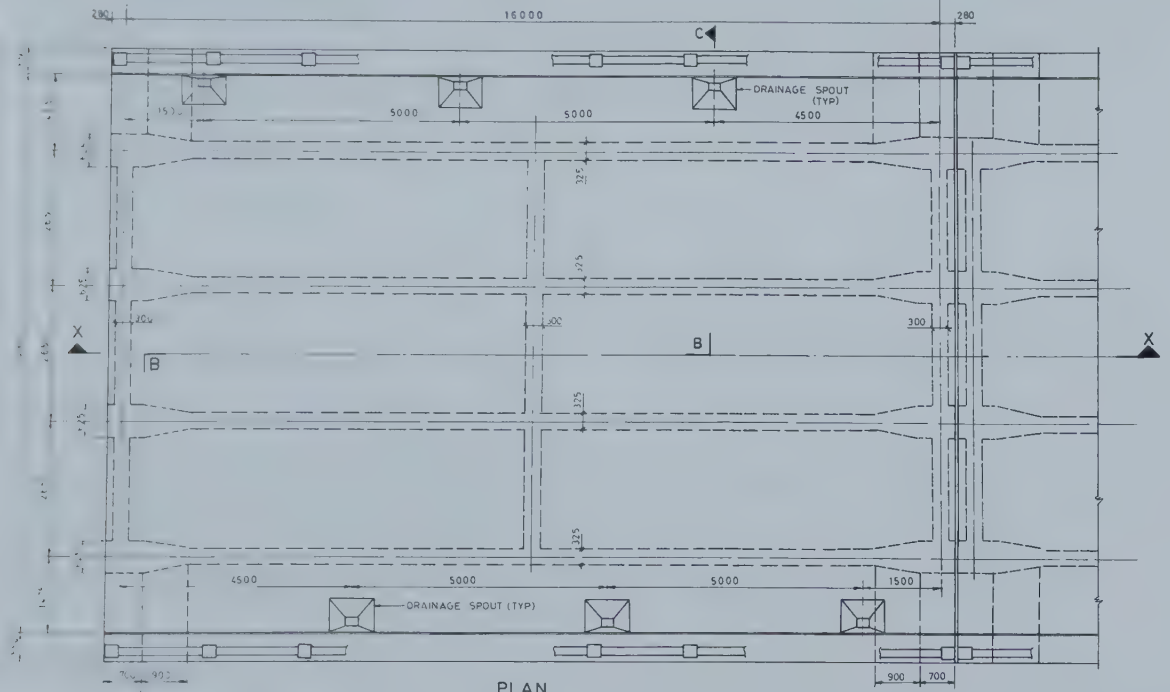
STANDARD DRAWINGS FOR ROAD BRIDGES

R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE.
18·0M. SPAN WITH FOOTPATHS
SCHEDULE OF REINFORCEMENT

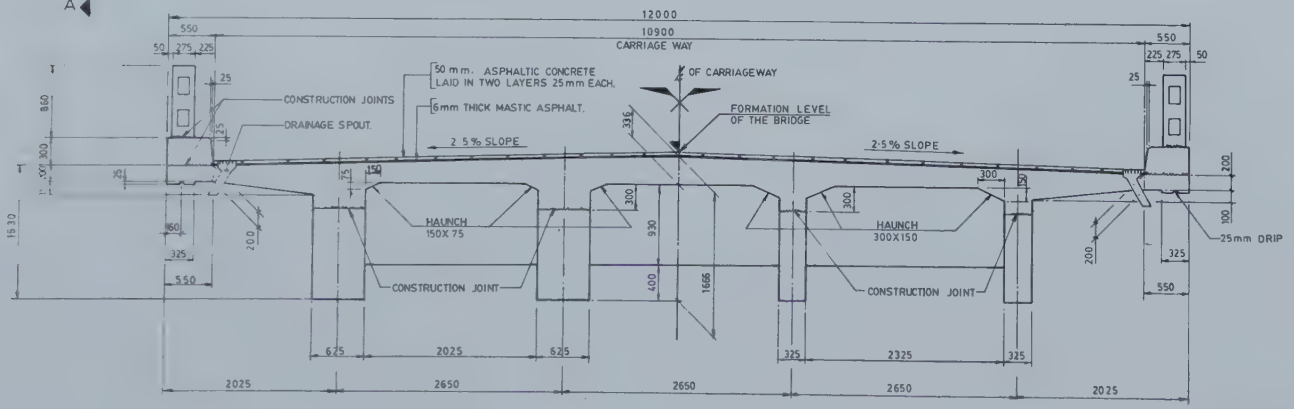
RECOMMENDED BY		APPROVED BY	1991
(M P MARWAH) E. E	(N K. SINHA) S. E	(M K MUKHERJEE) C. E	DRG. NO. SD/237 - Sh-2



SECTIONAL ELEVATION X X



PLAN



SECTION A B C

DRG. NO. SD / 240.

NOTES

This drawing shall be read in conjunction with the following drawings.

i) General notes ... Drg No. SD / 200.
ii) Details of R.C C. railings ... Drg No SD/201.
iii) Details of rocker and roller bearings... Drg No SD/204.
iv) Details of miscellaneous items... Drg. No. SD / 205.
v) Details of deck slab (for bridges without footpaths)... Drg. No. SD / 242.
vi Details of longitudinal girders ... Drg. No. SD / 244.
vii) Details of cross girders... Drg No SD / 245.
viii) Schedule of reinforcement ... Drg No. SD / 246. Sh-1 & Sh-2.

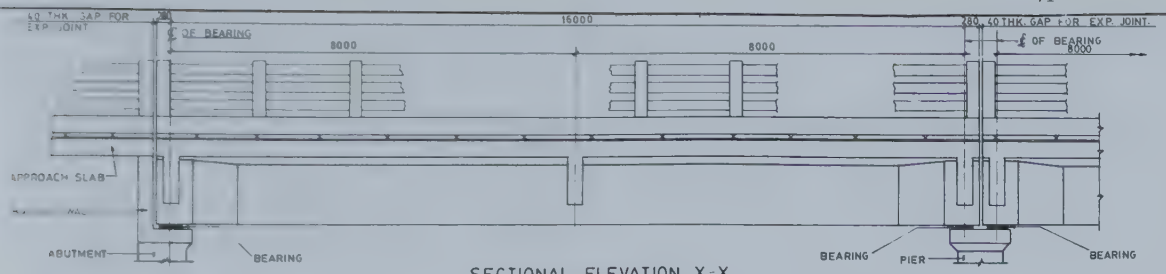
MKD	DATE	DESCRIPTION	BY
		REVISION	

GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
(ROADS WING), NEW DELHI.

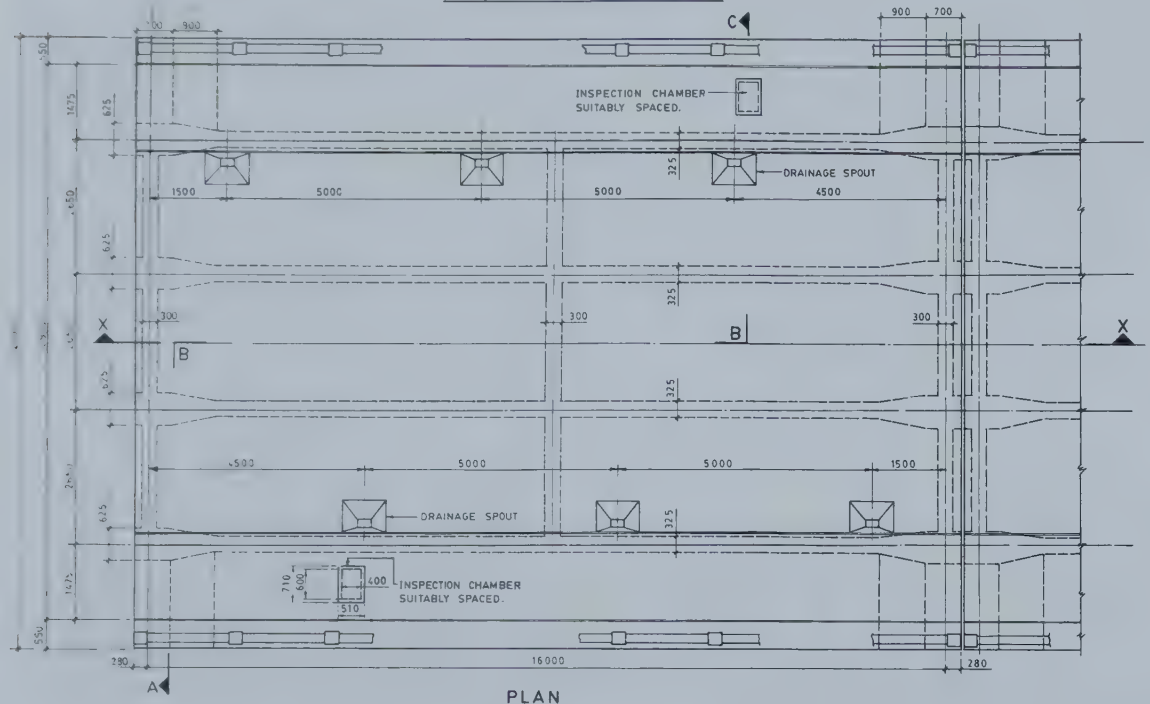
STANDARD DRAWINGS FOR ROAD BRIDGES.

R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE
16·0 M. SPAN WITHOUT FOOTPATHS
GENERAL ARRANGEMENT

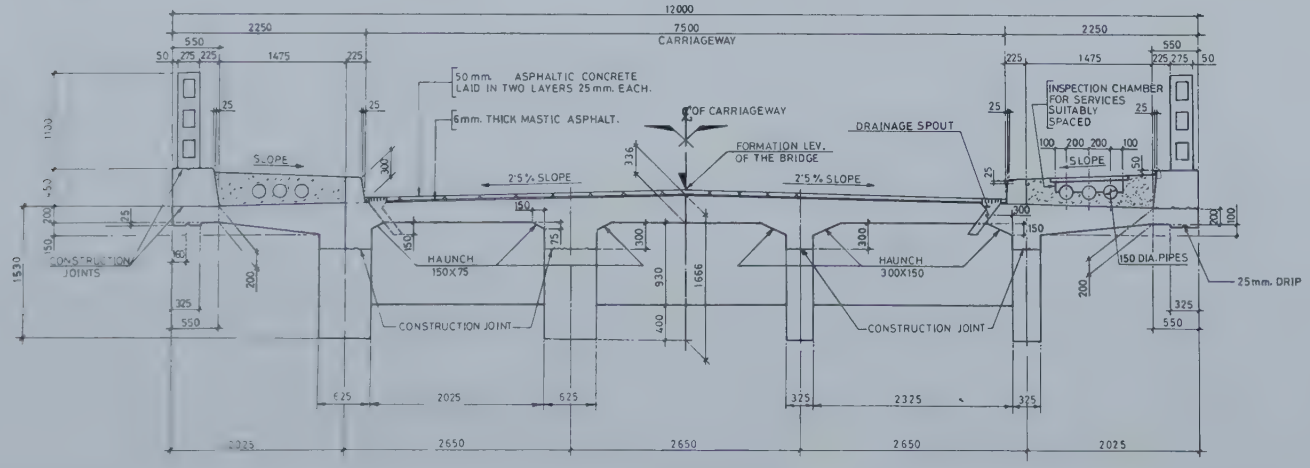
RECOMMENDED BY		APPROVED BY	1991
(M P MARWAH), E E	(N.K. SINHA), S.E.	(M K MUKHERJEE), C E	DRG. NO. SD / 240.



SECTIONAL ELEVATION X-X



PLAN



SECTION ABC

DRG. NO.-SD/241

NOTES

1. This drawing shall be read in conjunction with the following drawings.
   - i) General notes ... Drg. No. SD/200.
   - ii) Details of R.C.C. railings ... Drg. No. SD/202.
   - iii) Details of rocker and roller bearings ... Drg. No. SD/204.
   - iv) Details of miscellaneous items ... Drg. No. SD/205.
   - v) Details of deck slab (for bridges with footpaths) ... Drg. No. SD/243.
   - vi) Details of longitudinal girders ... Drg. No. SD/244.
   - vii) Details of cross girders ... Drg. No. SD/245.
   - viii) Schedule of reinforcement ... Drg. No. SD/247 Sh.1 & Sh.2.

MKD.	DATE	DESCRIPTION	BY
		REVISION	

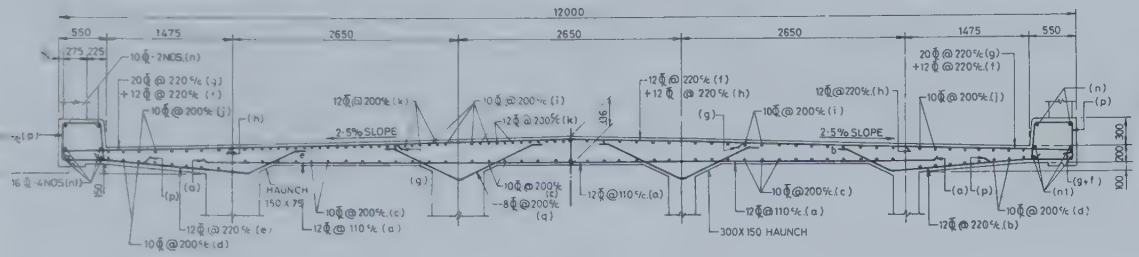
GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT.
(ROADS WING), NEW DELHI.

STANDARD DRAWINGS FOR ROAD BRIDGES.

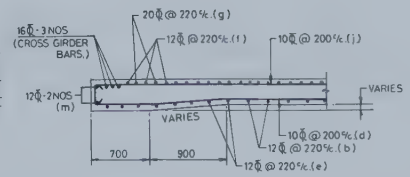
R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE 16·0 M. SPAN WITH FOOTPATHS. GENERAL ARRANGEMENT.

RECOMMENDED BY.		APPROVED BY	1991
(M.P. MARWAH). E.E	(N.K. SINHA). S.E.	(M.K. MUKHERJEE). C.E.	DRG. NO. SD/241

DRG. NO SD/242



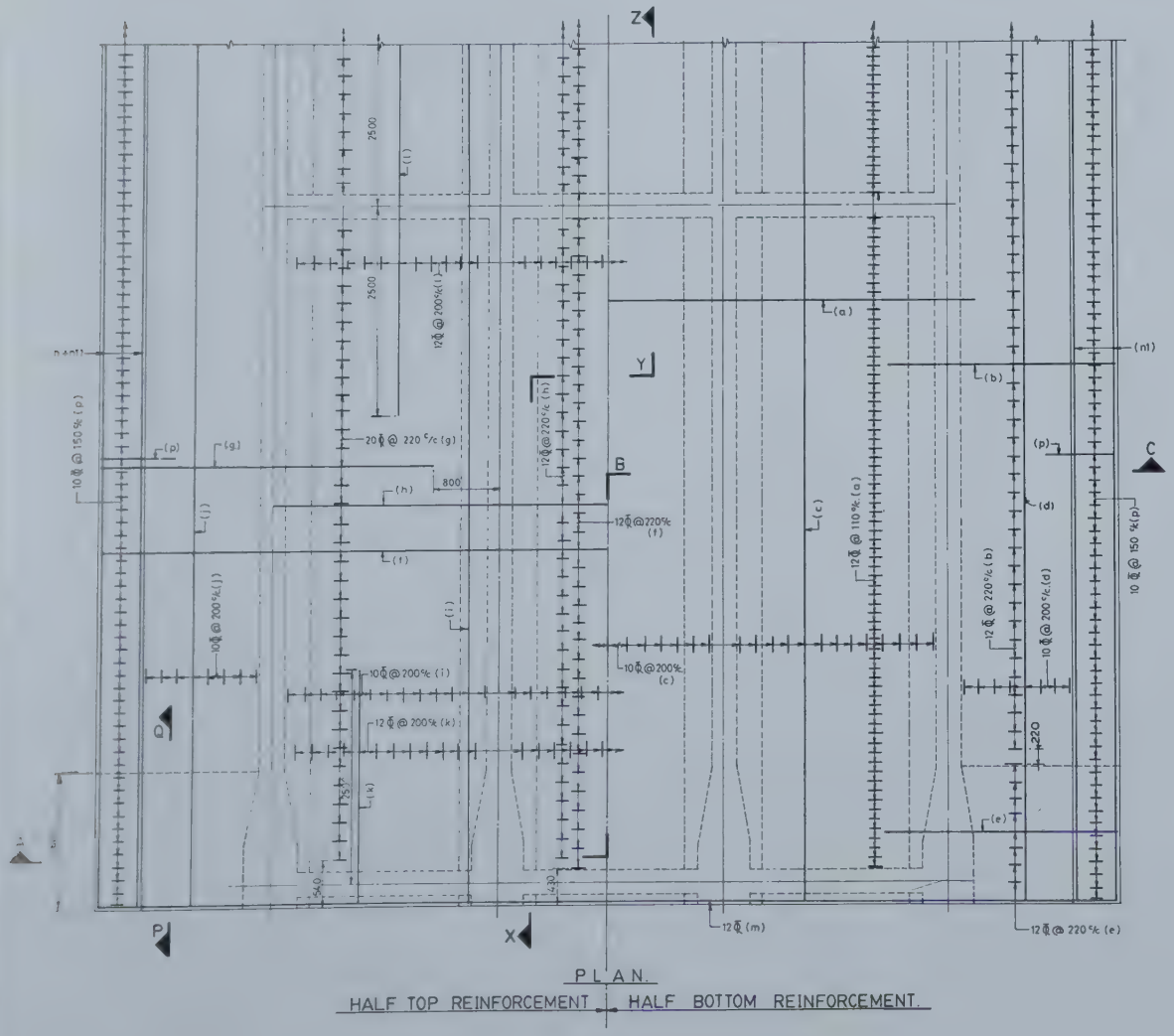
CROSS SECTION A B C.



SECTION P Q.

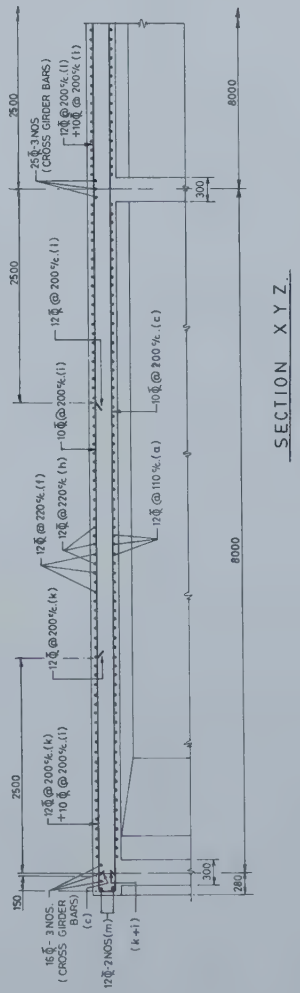
NOTES :

1. The reinforcement for railing posts should be properly anchored in the deck slab before casting the slab.
2. This drawing shall be read in conjunction with following drgs.
   i) General notes .... Drg. No. SD/200.
   ii) Details of R.C.C. railing .... Drg. No. SD/201.
   iii) Details of rocker and roller bearings....Drg. No. SD/204.
   iv) Details of miscellaneous items....Drg. No. SD/205.
   v) General arrangement (for bridges without footpaths) ....Drg. No. SD/240.
   vi) Details of longitudinal girders.... Drg. No. SD/244.
   vii) Details of cross girders.... Drg. No. SD/245.
   viii) Schedule of reinforcement....Drg. No. SD/246. Sh-1 & Sh-2.



PLAN.

HALF TOP REINFORCEMENT | HALF BOTTOM REINFORCEMENT.



SECTION X Y Z.

MKD	DATE	DESCRIPTION	BY

REVISION

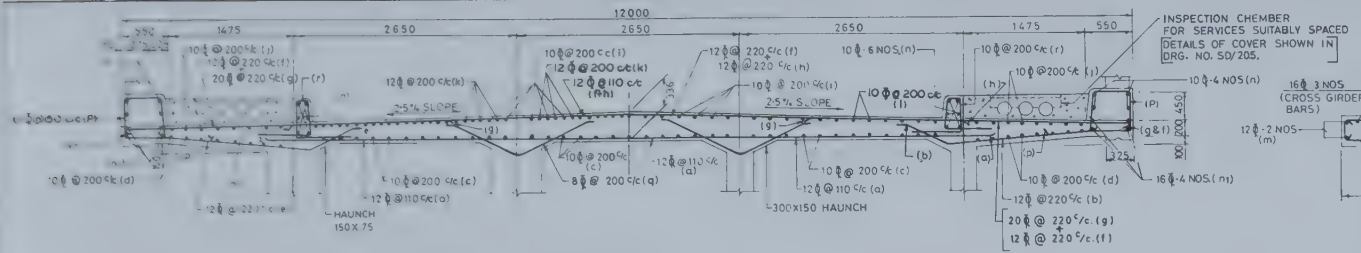
GOVERNMENT OF INDIA.
MINISTRY OF SURFACE TRANSPORT.
(ROADS WING), NEW DELHI.

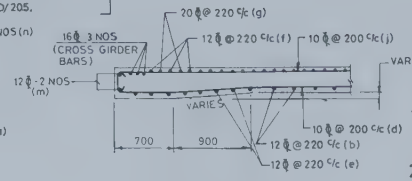
STANDARD DRAWINGS FOR ROAD BRIDGES.

R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE 16·0 M SPAN WITHOUT FOOTPATHS DETAILS OF DECK SLAB

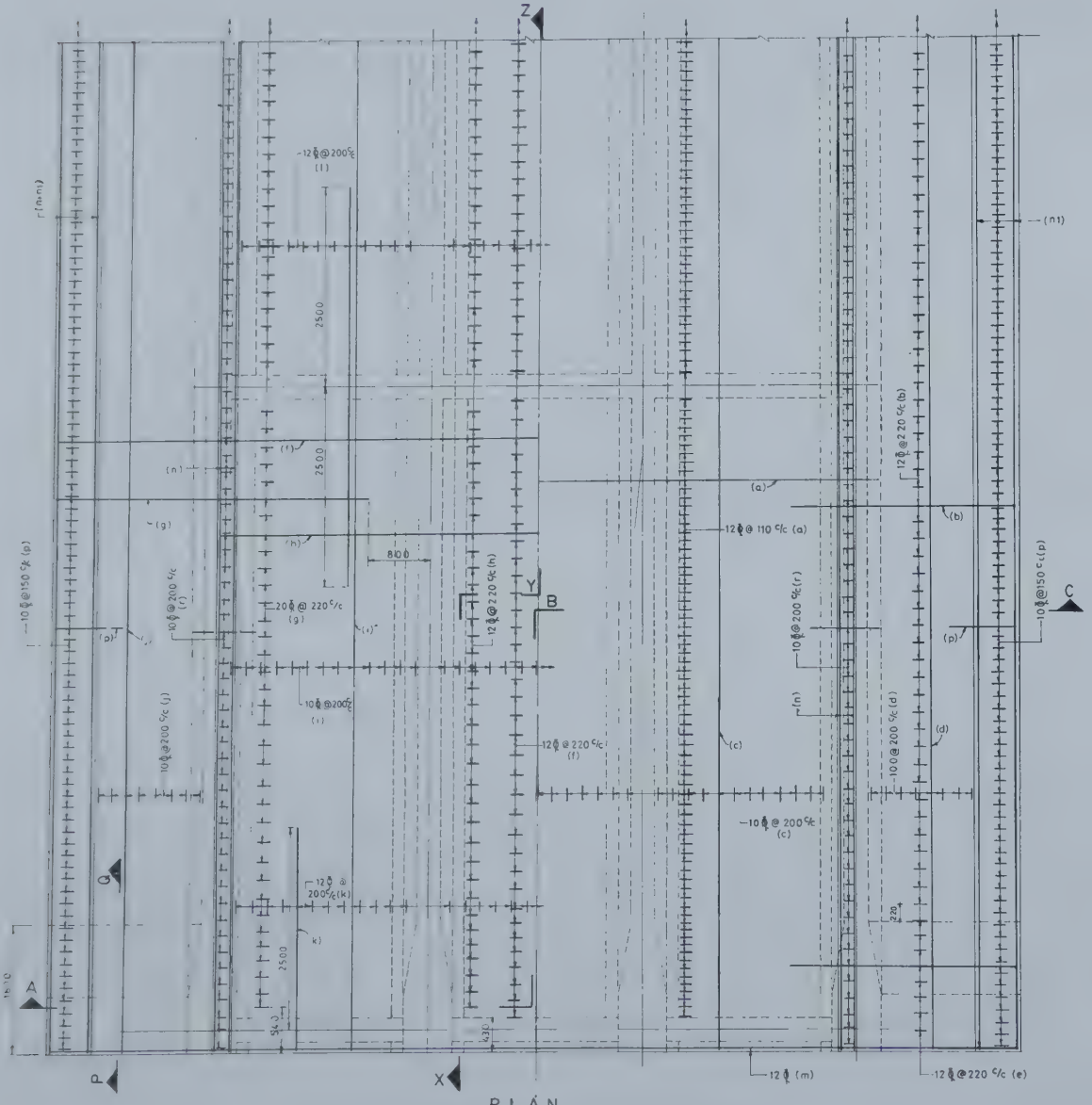
RECOMMENDED BY		APPROVED BY	1991
(M P MARWAH) E E	(N K SINHA) S E	(M. K MUKHERJEE) C E	DRG. NO. SD/242.

DRG. NO. SD/243

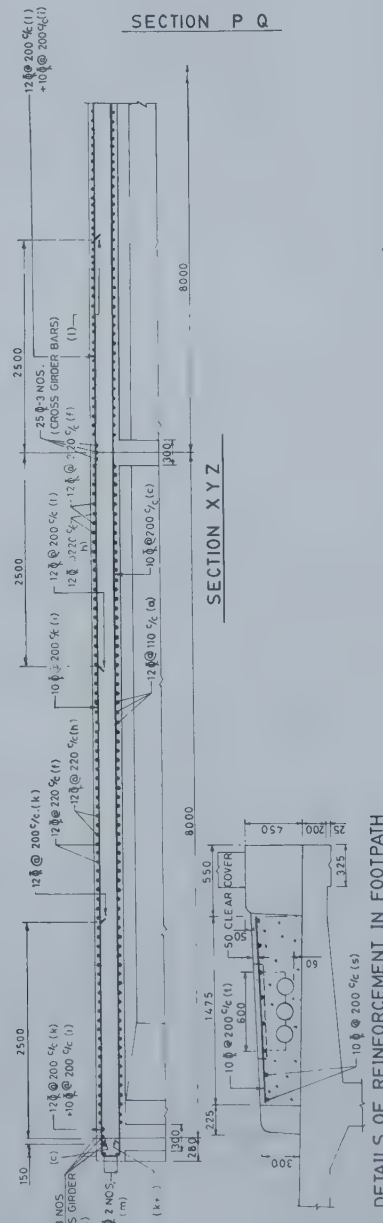




CROSS SECTION ABC



SECTION P Q



SECTION XYZ

DETAILS OF REINFORCEMENT IN FOOTPATH

NOTES :

1. The reinforcement for railing post should be properly anchored in the deck slab before casting the slab.
2. This drawing shall be read in conjunction with following drgs.
   - i) General notes....Drg. No. SD/200.
   - ii) Details of R.C.C. railing....Drg. No. SD/202
   - iii) Details of rocker and roller bearings...Drg. No. SD/204.
   - iv) Details of miscellaneous items....Drg. No. SD/205.
   - v) General arrangement (for bridges with footpaths)....Drg. No. SD/241.
   - vi) Details of longitudinal girders....Drg. No. SD/244.
   - vii) Details of cross girders....Drg. No. SD/245
   - viii) Schedule of reinforcement.. Drg. No. SD/247 Sh-1 & Sh-2

MKD	DATE	DESCRIPTION	BY
REVISION			

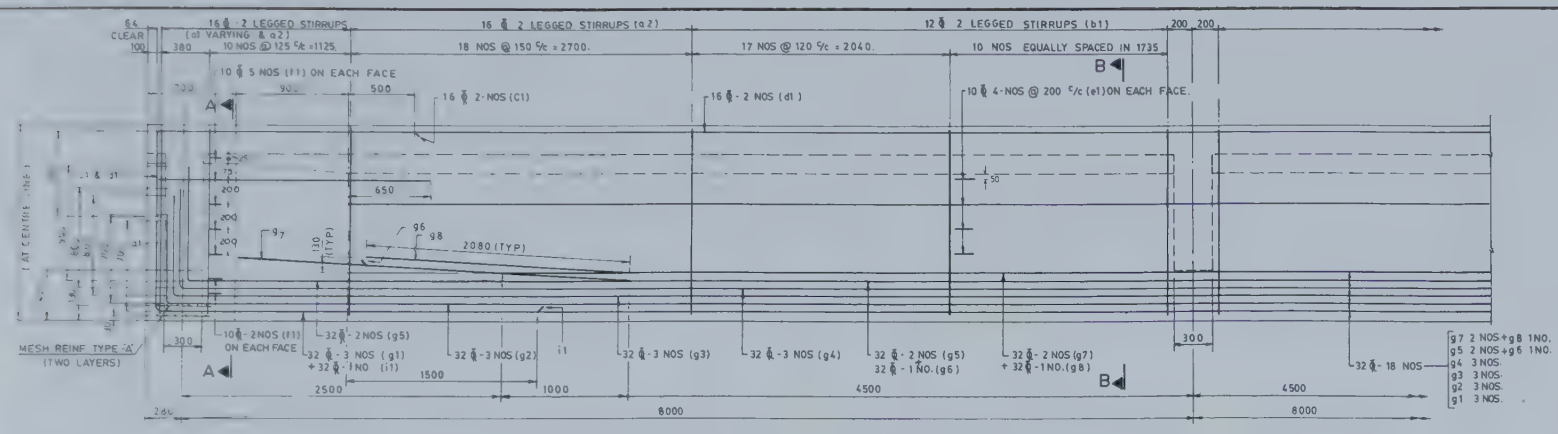
GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
(ROADS WING), NEW DELHI

STANDARD DRAWINGS FOR ROAD BRIDGES

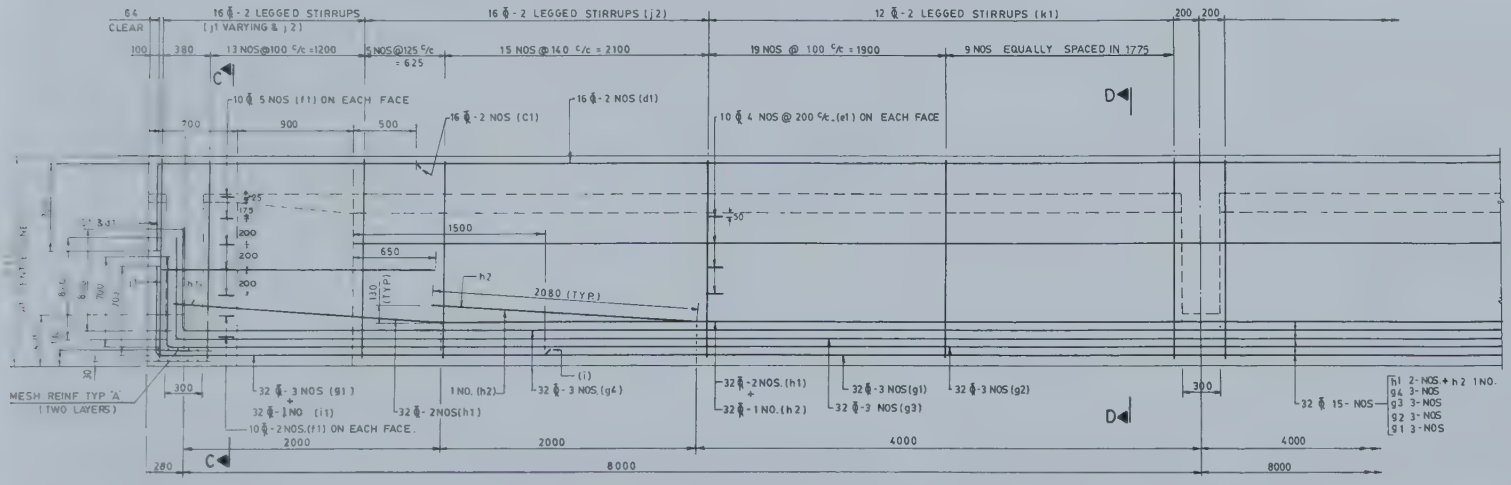
R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE 16·0 M. SPAN WITH FOOTPATHS DETAILS OF DECK SLAB.

RECOMMENDED BY		APPROVED BY	1991
(M P MARWAH) E.E.	(N K SINHA) S.E.	M.K. MUKHERJEE C.E.	DRG. NO. SD/243

DRG. NO SD/244.


16 ϕ - 2 LEGGED STIRRUPS (a1 VARYING & a2)
16 ϕ 2 LEGGED STIRRUPS (a2)
12 ϕ 2 LEGGED STIRRUPS (b1)
10 NOS @ 125 c/c = 1125
18 NOS @ 150 c/c = 2700.
17 NOS @ 120 c/c = 2040.
10 NOS EQUALLY SPACED IN 1735
10 ϕ 5 NOS (f1) ON EACH FACE
16 ϕ - 2 NOS (C1)
16 ϕ - 2 NOS (d1)
10 ϕ 4-NOS @ 200 c/c (e1) ON EACH FACE.
MESH REINF TYPE 'A' (TWO LAYERS)
10 ϕ - 2 NOS (f1) ON EACH FACE
32 ϕ - 2 NOS (g5)
32 ϕ - 3 NOS (g1) + 32 ϕ - 1 NO (i1)
32 ϕ - 3 NOS (g2)
32 ϕ - 3 NOS (g3)
32 ϕ - 3 NOS (g4)
32 ϕ - 2 NOS (g5) 32 ϕ - 1 NO. (g6)
32 ϕ - 2 NOS (g7) + 32 ϕ - 1 NO. (g8)
32 ϕ - 18 NOS
g7 2 NOS + g8 1 NO.
g5 2 NOS + g6 1 NO.
g4 3 NOS.
g3 3 NOS.
g2 3 NOS.
g1 3 NOS.
2080 (TYP.)
8000

LONGITUDINAL SECTION OF OUTER GIRDER


16 ϕ - 2 LEGGED STIRRUPS (j1 VARYING & j2)
16 ϕ - 2 LEGGED STIRRUPS (j2)
12 ϕ - 2 LEGGED STIRRUPS (k1)
13 NOS @ 100 c/c = 1200
5 NOS @ 125 c/c = 625
15 NOS @ 140 c/c = 2100
19 NOS @ 100 c/c = 1900
9 NOS EQUALLY SPACED IN 1775
10 ϕ 5 NOS (f1) ON EACH FACE
16 ϕ - 2 NOS (C1)
16 ϕ - 2 NOS (d1)
10 ϕ 4 NOS @ 200 c/c (e1) ON EACH FACE
MESH REINF TYP 'A' (TWO LAYERS)
32 ϕ - 3 NOS (g1) + 32 ϕ - 1 NO (i1)
1 NO. (h2)
32 ϕ - 3 NOS. (g4)
32 ϕ - 2 NOS. (h1) + 32 ϕ - 1 NO. (h2)
32 ϕ - 3 NOS (g3)
32 ϕ - 3 NOS (g2)
32 ϕ 15 - NOS
h1 2 - NOS + h2 1 NO.
g4 3 - NOS
g3 3 - NOS
g2 3 - NOS
g1 3 - NOS
2080 (TYP.)
8000

LONGITUDINAL SECTION OF INNER GIRDER

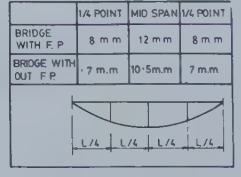
NOTES

1. Longitudinal girders shall be given upward camber on account of dead load deflection as given in the table -I.
2. 32 ϕ spacer bars shall be provided @ 1 m c/c between two tiers of longitudinal bars of girders.
3. This drawing shall be read in conjunction with the following drgs.

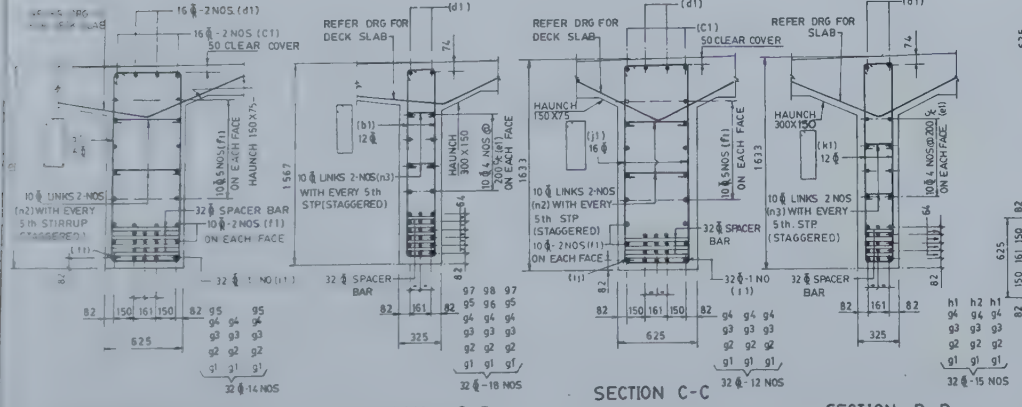
i) General notes ... Drg. No. SD/200.
ii) Details of rocker and roller bearing ... Drg. No. SD/204.
iii) General arrangement (for bridges without footpaths) ... Drg. No. SD/240.
iv) General arrangement (for bridges with footpaths) ... Drg. No. SD/241.
v) Details of deck slab (for bridges without footpaths) ... Drg. No. SD/242.
vi) Details of deck slab (for bridges with footpaths) Drg. No SD/243.
vii) Details of cross girders ... Drg. No. SD/245.
viii) Schedule of reinforcement (for bridges without footpaths) Drg. No. SD/246. Sh-1 & Sh-2.
ix) Schedule of reinforcement (for bridges with footpaths) ... Drg. No. SD/247. Sh-1 & Sh-2.

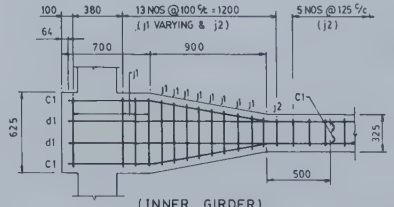
TABLE - I

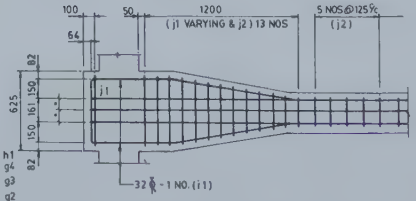
	1/4 POINT	MID SPAN	1/4 POINT
BRIDGE WITH F.P	8 m m	12 m m	8 m m
BRIDGE WITH OUT F.P	7 m.m	10·5m.m	7 m.m

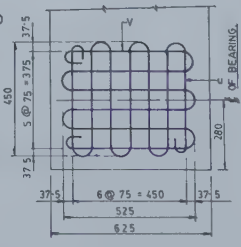


DEAD LOAD DEFLECTION DIAGRAM









MKD	DATE	DESCRIPTION	BY
		REVISION.	

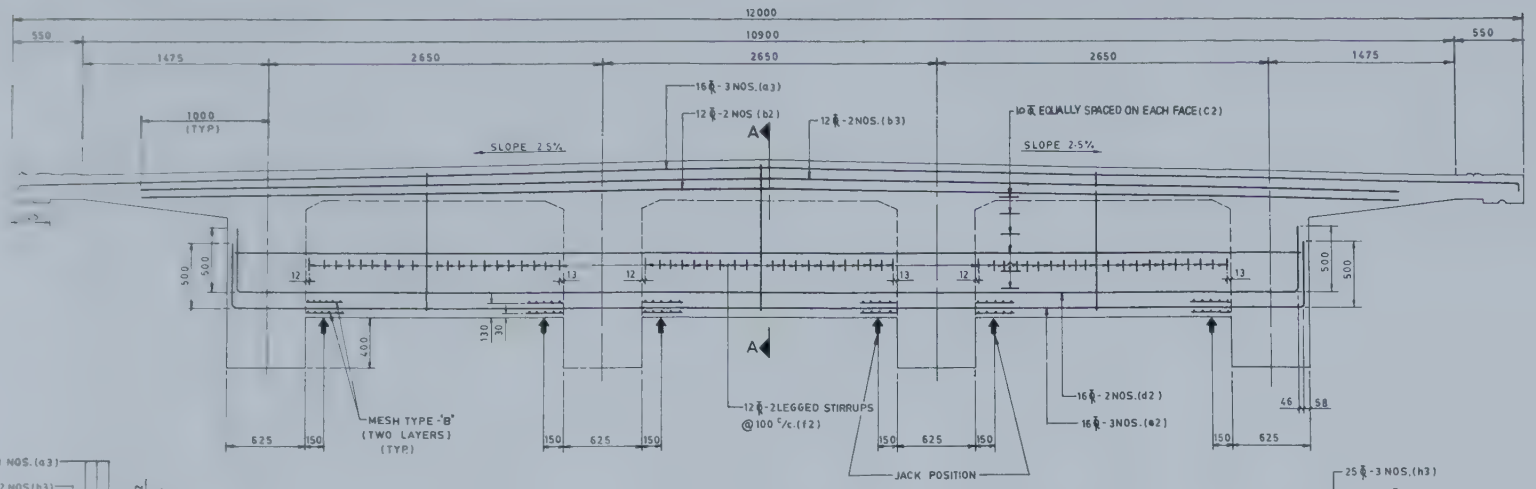
GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
(ROADS WING), NEW DELHI.

STANDARD DRAWINGS FOR ROAD BRIDGES

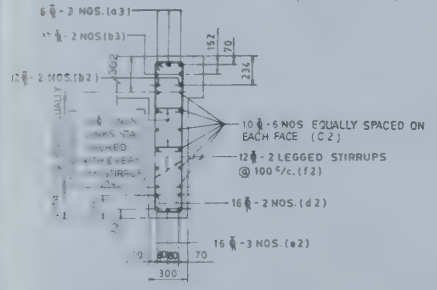
R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE 16·0 M. SPAN WITH & WITHOUT FOOTPATHS DETAILS OF LONGITUDINAL GIRDERS.

RECOMMENDED BY:		APPROVED BY	1991
(M. P. MARWAH), E.E	(N.K. SINHA) S.E	(M.K. MUKHERJEE) C.E	DRG. NO. SD/244.

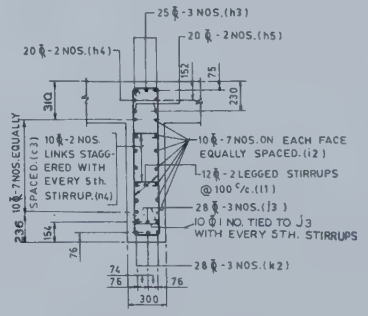
DRG. NO. SD/245



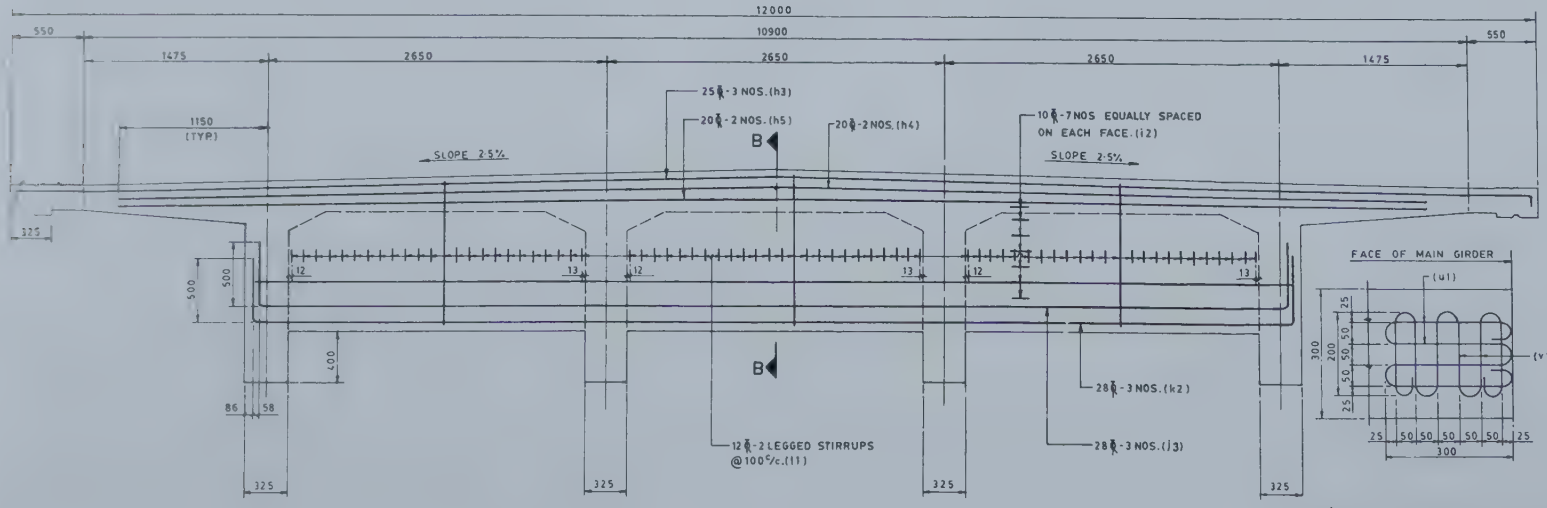
LONGITUDINAL SECTION OF END CROSS GIRDER



SECTION - A - A


25 - 3 NOS. (h3)
20 - 2 NOS. (h4)
20 - 2 NOS. (h5)
152
75
230
310
10 - 7 NOS. EQUALLY SPACED. (i3)
10 - 2 NOS. LINKS STAGGERED WITH EVERY 5th. STIRRUP. (i4)
10 - 7 NOS. ON EACH FACE EQUALLY SPACED. (i2)
12 - 2 LEGGED STIRRUPS @ 100 c/c. (i1)
28 - 3 NOS. (j3)
10 I NO. TIED TO J3 WITH EVERY 5TH. STIRRUPS
236
154
76
28 - 3 NOS. (k2)
74
76
76
300

SECTION - B - B



LONGITUDINAL SECTION OF INTERMEDIATE CROSS GIRDER

8 MESH REINFORCEMENTS TYPE - 'B'

NOTES :

1. The location of jacks for lifting of the superstructure to replace bearings etc. is shown thus ⬆. This shall be distinctly etched for easy identification on the end cross girders and pier / abutment caps.
2. During the lifting operation all the six jacks placed under the end cross-girder in line with the bearings shall be operated simultaneously using single operating console, grouping the pump and control system, so as to ensure that the reactions on all the six jacks are equal at all times.
3. Capacity of each jack shall not be less than 28T.
4. This drawing shall be read in conjunction with the following drawings.

i) General notes... Drg. No. SD/200.
ii) Details of rocker and roller bearings... Drg. No. SD/204.
iii) General arrangement (for bridges without foot paths)... Drg. No. SD/240.
iv) General arrangement (for bridges with foot paths)... Drg. No. SD/241.
v) Details of deck slab (for bridges without foot paths)... Drg. No. SD/242.
vi) Details of deck slab (for bridges with foot paths). Drg. No. SD/243.
vii) Details of longitudinal girders... Drg. No. SD/244
viii) Schedule of reinforcement. (for bridges without foot paths)... Drg. No. SD/246. Sh-1 & Sh-2.
ix) Schedule of reinforcement. (for bridges with-foot paths)... Drg. No. SD/247. Sh-1 & Sh-2.

MKD.	DATE	DESCRIPTION	BY
		REVISION	

GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
(ROADS WING), NEW DELHI.

STANDARD DRAWINGS FOR ROAD BRIDGES

R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE 16·0 M. SPAN WITH & WITHOUT FOOTPATHS DETAILS OF CROSS GIRDERS.

RECOMMENDED BY :		APPROVED BY	1991
(M. P. MARWAH). E.E.	(N.K.SINHA) S.E.	(M. K. MUKHERJEE) C.E.	DRG. NO. SD/245

DRG. NO. SD/246-Sh-1.

SCHEDULE OF REINFORCEMENT (PER SPAN)

A) H.Y.S.D. BARS

Sl NO	Type of bars	Shape of bars (not to scale) (dimensions are in millimetres)	Dia of bars (mm)	Length of each bar (mm)	No of bars	Total length (m)	Weight (kg)
		Slab					
1	a	8575	12	8575	142	1217·65	1095·89
2	b	150, 249, 530, R=120, 1692, 500, 137, 140, R=120	12	2976	120	357·12	321·41
3	c	150, L, 16460, 150, L varying from 109 to 212	10	16960	39	661·44	396·86
4	d	140, L, 650, 901, R=100, 13360, varying from 0 to 70, R=100, 901, 650, 140, L varying from 68 to 270	10	16960	16	271·36	162·82
5	e	varying from 150 530 to 700, R=120, varying from 1543 to 1692, 500, 140, varying from 249 to 313, R=120, varying from 137 to 198	12	2987	32	95·58	86·02
6	f	75, 5952, R=120, 5952, 75, 149	12	12054	72	867·89	781·10
7	g	120, 3826, 96	20	3946	140	552·44	1381·10
8	h	3976, R=120, 3976, 99	12	7952	70	556·64	500·98
9	i	16460, L, 150, 150, L, L = varying from 109 to 212	10	16960	39	661·44	396·86
10	j	16460, L, 75, 75, L, L = varying from 68 to 270	10	16888	16	270·21	162·13
11	k	2730, L, 170, L = varying from 109 to 212	12	2988	72	215·14	193·63
12	l	5000	12	5000	36	180·00	162·00
13	m	11900	12	11900	4	47·60	42·84
14	n	16460	10	16460	4	65·84	39·50
15	n_1	16460	16	16460	8	131·68	210·69
16	p	380, 405, 380, 143, 500, varying from 37 to 54	10	2208	222	490·18	294·10
17	q	393, 150, 860, R 80, 950, 150, R·80, 433	8	2110	160	337·6	135·04
		Longitudinal girders					
1	a_1	L_2 varying from 1437 to 1441, L_2 L_1, L_1 varying from 1429 to 1433, varying from 193 to 493	16	3876	44	170·54	272·86
2	a_2	1437, 193, 1437, 193	16	3576	72	257·47	411·95
3	b_1	1437, 193, 1437, 193	12	3496	108	377·57	339·81
4	c_1	708, R=96, 166, 636, 913, 500; Elevation; Plan	16	2693	16	43·09	68·94
5	d_1	16432, 708, R=96, 708	16	17720	8	141·76	226·82
6	e_1	13360	10	13360	32	427·52	256·51
7	f_1	160, 636, 913, 650	10	2199	112	246·29	147·77
8	g_1	716, R=192, 716, 16432	32	17608	12	211·30	1331·19
9	g_2	716, R=192, 716, 16304	32	17480	12	209·76	1321·49

Sl NO	Type of bars	Shape of bars (not to scale) (dimensions are in millimetres)	Dia of bars (mm)	Length of each bar (mm)	No of bars	Total length (m)	Weight (Kg)
10	g_3	816, R=192, 816, 16176	32	17552	12	210·62	1326·91
11	g_4	816, R 192, 816, 16048	32	17424	12	209·09	1317·27
12	g_5	916, R=192, 916, 15920	32	17496	4	69·98	440·87
13	g_6	2080, 9000, 2080, 162	32	13160	2	26·32	165·82
14	g_7	2080, 11000, 2080, 162	32	15160	4	60·64	382·03
15	g_8	2080, 9000, 2080, 162	32	13160	2	26·32	165·82
16	h_1	2080, 12000, 2080, 162	32	16160	4	64·64	407·23
17	h_2	2080, 8000, 2080, 162	32	12160	2	24·32	153·22
18	i_1	493, 636, 913, R=192, 1500, 1500, 636, 913	32	6335	8	50 68	319·28
19	j_1	L_1=Varying from 1503 to 1507, L_1 L_2, L_2=Varying from 1495 to 1499, Varying from 193 to 493	16	4008	56	224·45	359·12
20	j_2	1503, 193, 193, 1499	16	3708	80	296·64	474·62
21	k_1	1499, 193, 193, 1503	12	3628	112	406·34	365·71
22	n_2	140, L, 140, L=Varying from 213 to 513	10	583	48	27·98	16·79
23	n_3	140, 213, 140	10	433	152	65·82	39·49

B) M.S. BARS (MESH REINFORCEMENT IN LONGITUDINAL GIRDERS)

1	u	25, 375, 375, 30, 30, 37·5, 37·5, 25, 375, 75, 75, 75, 75, 75, 75	8	3550	16	56·80	22·72
2	v	25, 30, 30, 75, 75, 75, 75, 75, 75, 37·5, 450, 25	8	3506	16	56·10	22·44

NOTES

1. Dimensions in the schedule are given as per IS:2502-1963
2. The exact length of the bars will be determined by the actual laps with splices adopted at site.
3. This drawing shall be read in conjunction with following drawings.

i) General notes---Drg.No. SD/200.
ii) Details of deck slab (for bridges without footpaths)--- Drg.No. SD/242.
iii) Details of longitudinal girders---Drg. No. SD/244.

MKD	DATE	DESCRIPTION	BY
		REVISION	

GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
(ROADS WING), NEW DELHI

STANDARD DRAWINGS FOR ROAD BRIDGES

R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE
16·0 M SPAN WITHOUT FOOTPATHS
SCHEDULE OF REINFORCEMENT

RECOMMENDED BY:		APPROVED BY:	1991
(M. P. MARWAH). E. E.	(N. K. SINHA). S. E.	(M. K. MUKHERJEE) C. E.	DRG. NO. SD/246-Sh-1.

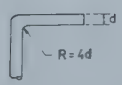
DRG. NO. SD/246 Sh-2

A) H.Y.S.D. BARS — SCHEDULE OF REINFORCEMENT (PER SPAN)

Sl. No.	Type of bars	Shape of bars (not to scale) (dimensions are in millimetres)	Dia of bars (mm.)	Length of each bar (mm.)	No. of bars	Total length (m.)	Weight (kg.)
		CROSS GIRDERS					
1	a_3	95, 5952, 5952, 195, 152, R=160	16	12094	6	72·56	116·10
2	b_2	4977, 4977, 128, R=120	12	9954	4	39·82	35·84
3	b_3	4976, 4976, 119, R=120	12	9952	4	39·81	35·83
4	c_2	106, R=40, 8443, 106	10	8595	24	206·28	123·77
5	d_2	508, R=64, 8383, 508	16	9303	4	37·21	59·54
6	e_2	508, R=64, 8475, 508	16	9395	6	56·37	90·19
7	f_2	176, Varying from 1050 to 1142	12	2784	126	350·78	315·70
8	h_3	100, 5952, 5952, 100, 161, R=250	25	12104	3	36·31	137·99
9	h_4	5126, 5126, 121, R=200	20	10252	2	20·50	51·25
10	h_5	5126, 5126, 91, R=200	20	10252	2	20·50	51·25
11	i_2	400, R=40, 8151, 400	10	8891	14	124·47	74·68
12	j_3	514, R=168, 8015, 514	28	8819	3	26·46	127·01
13	k_2	514, R=168, 8131, 514	28	8935	3	26·81	128·69
14	l_1	176, Varying from 1048 to 1142	12	2782	72	200·30	180·27
15	n_4	140, 196, 140	10	416	105	43·68	26·21

B) M.S. BARS (MESH REINFORCEMENT IN CROSS GIRDERS)

16	u1	30, 30, 50, 50, 50, 25, 250, 25	8	1453	24	34·87	13·95
17	v1	30, 30, 25, 150, 25, 50, 50, 50, 50, 50	8	1510	24	36·24	14·50



d = Dia of bar
For bar upto 25 mm. dia

d = Dia of bar
For bar above 25 mm. dia

MAXIMUM DEAD LOAD REACTIONS (in KN)

AT ABUTMENT	AT PIER
1425	2849

TOTAL QUANTITY* (PER SPAN)

1. STEEL ... ... H.Y.S.D. BARS 19·14 T
   (including 5% extra for laps and wastage) M.S. BARS ... 0·08 T
2. (i) CONCRETE ... ... 99·46 m^3

* Excluding quantities for railing.

NOTES:

1. Dimensions in the schedule are given as per IS:2502-1963.
2. The exact length of the bars will be determined by the actual laps / splices adopted at site.
3. This drawing shall be read in conjunction with following drawings.
   i) General notes... Drg. No. SD/200.
   ii) Details of cross girders Drg. No. SD/245.
   iii) Schedule of reinforcement... Drg. No. SD/246 Sh-1.

MKD.	DATE	DESCRIPTION	BY
		REVISION	

GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
(ROADS WING), NEW DELHI.

STANDARD DRAWINGS FOR ROAD BRIDGES

R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE
16·0 M SPAN WITHOUT FOOTPATHS
SCHEDULE OF REINFORCEMENT

RECOMMENDED BY:		APPROVED BY	1991
(M.P. MARWAH). E.E.	(N.K. SINHA). S.E.	(M.K. MUKHERJEE). C.E.	DRG. NO. SD/246 Sh-2

DRG. NO-SD/247 Sh-1

SCHEDULE OF REINFORCEMENT (PER SPAN)

A) H.Y.S.D. Bars.

Sl. No.	Type of bars	Shape of bars (not to scale) (dimensions are in millimetres	Dia of bars (m.m.)	Length of each bar (m.m.)	No of bars	Total length (m.)	Weigth (kg.)
		Slab / Footpath					
1	a	8575	12	8575	142	1217 65	1095 89
2	b	150, 249, 530, R=120, 1692, 500, 140, 137, R=120	12	2976	120	357·12	321·41
3	c	150, 150, L, L, 16460, L=Varying from 109 to 212	10	16960	37	627·52	376·51
4	d	140, 140, 13360, R=100, R=100, 901, 901, Varying from 0 to 70, 650, 650, L=Varying from 68 to 270	10	16960	16	271·36	162·82
5	e	150, Varying from 249 to 319, Varying from 530 to 700, R=120, Varying from 1543 to 1692, R=120, 500, 140, Varying from 137 to 198	12	2987	32	95·58	86·02
6	f	5952, 5952, R=120, 75, 75, 169	12	12054	72	867·89	781·10
7	g	3826, 120, 96	20	3946	140	552·44	1381·10
8	h	3976, 3976, R=120, 99	12	7952	70	556·64	500·98
9	i	16460, L, L, 150, 150, L=Varying from 109 to 212	10	16960	37	627·52	376·51
10	j	16460, L, L, 75, 75, L=Varying from 68 to 270	10	16888	16	270·21	162·13
11	k	2730, L, 170, L=Varying from 109 to 212	12	2988	72	215·14	193·63
12	l	5000	12	5000	36	180·00	162·00
13	m	11900	12	11900	4	47·60	42·84
14	n	16460	10	16460	20	329·20	197·52
15	n_1	16460	16	16460	8	131·68	210·69
16	p	405, 530, 530, 438, 500, Varying from 37 to 54	10	2503	222	555·67	333·40
17	q	150, 393, R=80, 860, 950, 150, R=80, 433	8	2110	160	337·6	135·04
18	r	80, 390, 390, 500, 500	10	1860	166	308·76	185·26
19	s	16460	10	16460	16	263·36	158·02
20	t	1400	10	1400	166	232·40	139·44
		Longitudinal girder					
1	a_1	L_2=Varying from 1437 to 1441. L2 L1 L_1=Varying from 1429 to 1433. Varying from 193 to 493	16	3876	44	170·54	272·86
2	a_2	193, 1433, 1437, 193	16	3576	72	257·47	411·95
3	b_1	193, 1433, 1437, 193	12	3496	108	377·57	339·81

Sl. No.	Type of bars	Shape of bars (not to scale) (dimensions are in millimetres)	Dia of bars (m.m.)	Length of each bar (m.m.)	No of bars	Total length (m.)	Weigth (kg.)
4	c_1	708, R=96, Elevation, 636, 913, 500, Plan	16	2693	16	43·09	68·94
5	d_1	16432, 708, R = 96, 708	16	17720	8	141·76	226·82
6	e_1	13360	10	13360	32	427·52	256·51
7	f_1	160, 636, 913, 650	10	2199	112	246·29	147·77
8	g_1	716, R=192, 716, 16432	32	17608	12	211·30	1331·19
9	g_2	716, R=192, 716, 16304	32	17480	12	209·76	1321·49
10	g_3	816, R=192, 816, 16176	32	17552	12	210·62	1326·91
11	g_4	816, R=192, 816, 16048	32	17424	12	209·09	1317·27
12	g_5	916, R=192, 916, 15920	32	17496	4	69·98	440·87
13	g_6	2080, 2080, 162, 9000	32	13160	2	26·32	165·82
14	g_7	2080, 2080, 162, 11000	32	15160	4	60·64	382·03
15	g_8	2080, 2080, 162, 9000	32	13160	2	26·32	165·82
16	h1	2080, 2080, 162, 12000	32	16160	4	64·64	407·23
17	h2	2080, 2080, 162, 8000	32	12160	2	24·32	153·22
18	i1	636, 913, 1500, 493, R=192, 636, 913, 1500	32	6335	8	50·68	319·28
19	j1	L_1=Varying from 1503 to 1507. L1 L2 L_2=Varying from 1495 to 1499. Varying from 193 to 493	16	4008	56	224·45	359·12
20	j2	193, 1499, 193, 1503	16	3708	80	296·64	474·62
21	k_1	193, 1499, 193, 1503	12	3628	112	406·34	365·71
22	n_2	L, 140, 140, L=Varying from 213 to 513	10	583	48	27·98	16·79
23	n_3	213, 140, 140	10	433	152	65·82	39·49

B) M.S. BARS (MESH REINFORCEMENT IN LONGITUDINAL GIRDERS)

1	u	25, 375, 375, 30, 30, 375, 375, 25, 75 75 75 75 75 75	8	3550	16	56·80	22·72
2	v	30, 25, 75 75 75 75 75, 30, 375, 450, 25	8	3506	16	56·10	22·44

NOTES

1. Dimensions in the schedule are given as per IS: 2502-1963.
2. The exact length of the bars will be determined by the actual laps with splices adopted at site.
3. This drawing shall be read in conjunction with the following drawings.
   - i) General notes ... Drg. No-SD/200.
   - ii) Details of deck slab (for bridges with footpaths) ... Drg. No-SD/243.
   - iii) Details of longitudinal girders Drg. No-SD/244.

MKD.	DATE	DESCRIPTION	BY.
		REVISION.	

GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
(ROADS WING), NEW DELHI

STANDARD DRAWINGS FOR ROAD BRIDGES

R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE
16·0 M SPAN WITH FOOTPATHS
SCHEDULE OF REINFORCEMENT.

RECOMMENDED BY:		APPROVED BY:	1991.
(M P MARWAH) E.E	(N.K SINHA) S.E.	(M.K. MUKHERJEE) C.E.	DRG. NO. SD/247 Sh-1

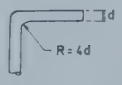
SCHEDULE OF REINFORCEMENT (PER SPAN)

A) H.Y.S.D. BARS

Sl. No	Type of bars	Shape of bars (not to scale) (dimensions are in millimetres)	Dia of bars (mm.)	Length of each bar (m.m.)	No. of bars	Total length (m.)	Weigth (kg.)
		CROSS GIRDERS					
1	a_3	95, 5952, R=160, 5952, 152	16	12094	6	72·56	116·10
2	b_2	178, 4977, R=120, 4977	12	9954	4	39·82	35·84
3	b_3	119, 4976, R=120, 4976	12	9952	4	39·81	35·83
4	c_2	R=40, 106, 8443, 106	10	8595	24	206·28	123·77
5	d_2	R=64, 508, 8383, 508	16	9303	4	37·21	59·54
6	e_2	R=64, 508, 8475, 508	16	9395	6	56·37	90·19
7	f_2	176, Varying from 1050 to 1142	12	2784	126	350·78	315·70
8	h3	150, 5952, R=250, 5952, 150, 161	25	12104	3	36·31	137·99
9	h4	121, 5126, R=200, 5126	20	10252	2	20·50	51·25
10	h5	61, 5126, R=200, 5126	20	10252	2	20·50	51·25
11	i_2	R=40, 400, 8151, 400	10	8891	14	124·47	74·68
12	j_3	R=168, 514, 8015, 514	28	8819	3	26·46	127·01
13	k_2	R=168, 514, 8131, 514	28	8935	3	26·81	128·69
14	l1	176, Varying from 1048 to 1142	12	2782	72	200·30	180·27
15	n4	140, 196, 140	10	416	105	43·68	26·21

B) M.S. BARS (MESH REINFORCEMENT IN CROSS GIRDERS)

16	u_1	30, 30, 50 50 50, 25 250 25	8	1453	24	34·87	13·95
17	v_1	30, 30, 25, 150, 25, 50 50 50 50 50	8	1510	24	36·24	14·50



d = Dia of bar
For bar upto 25 mm. dia.

d = Dia of bar
For bar above 25 mm. dia.

MAXIMUM DEAD LOAD REACTION (in KN)

At Abutment	At Pier
1636	3273

TOTAL QUANTITY *(PER SPAN)

1. STEEL ... ... H.Y.S.D. BARS 19·81 T
   ... M.S. BARS 0·08 T
   (including 5% extra for laps and wastage)
2.(i) CONCRETE ... ... 119·80 m^3

* Excluding quantities for railing.

NOTES

1. Dimensions in the schedule are given as per IS:2502-1963.
2. The exact length of the bars will be determined by the actual laps/splices adopted at site.
3. This drawing shall be read in conjunction with following drawings
   i) General notes ... Drg. No. SD/200.
   ii) Details of cross girder ... Drg. No. SD/245.
   iii) Schedule of reinforcement ... Drg. No. SD/247 Sh-1.

MKD.	DATE	DESCRIPTION	BY.
		REVISION	

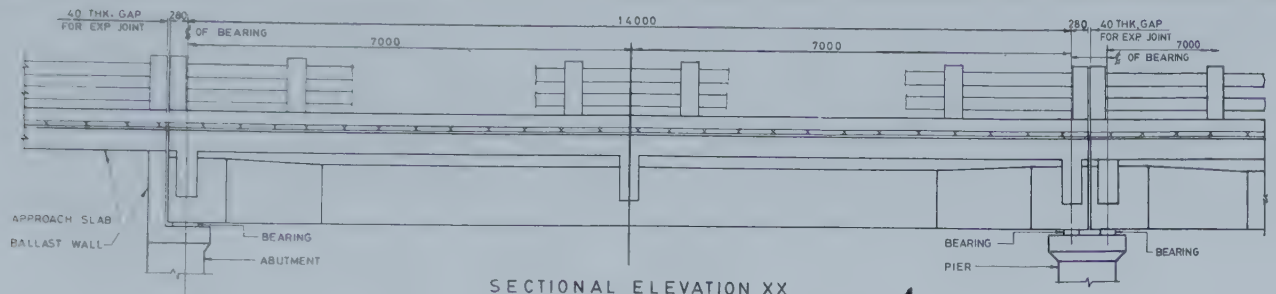
GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
(ROADS WING), NEW DELHI

STANDARD DRAWINGS FOR ROAD BRIDGES.

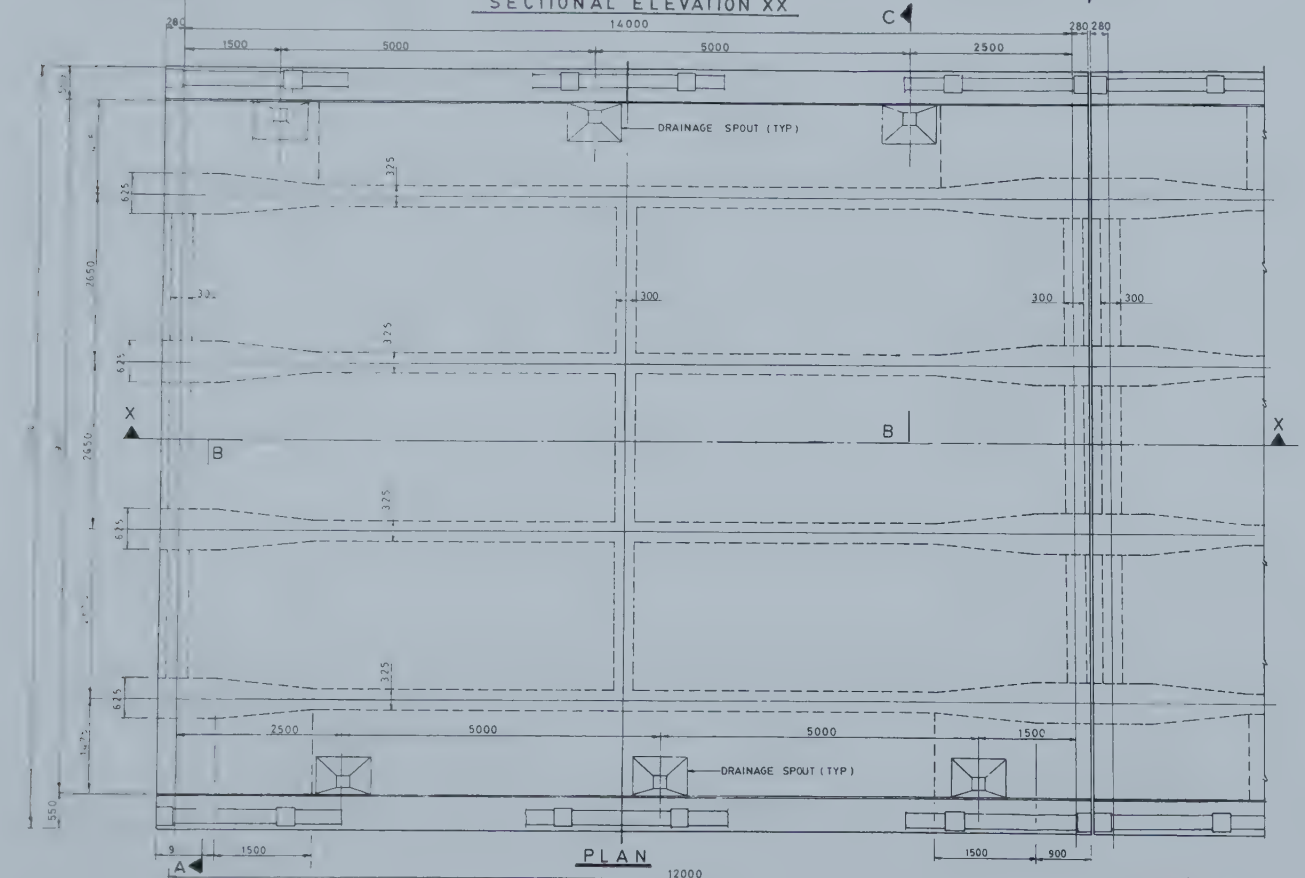
R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE
16·0 M. SPAN WITH FOOTPATHS
SCHEDULE OF REINFORCEMENT.

RECOMMENDED BY:		APPROVED BY:	1991.
(M.P. NARWAH) E.E.	(N.K. SINHA) S.E.	(M.K. MUKHERJEE) C.E.	DRG. NO. SD/247 Sh-2

DRG. NO.-SD/250



SECTIONAL ELEVATION XX



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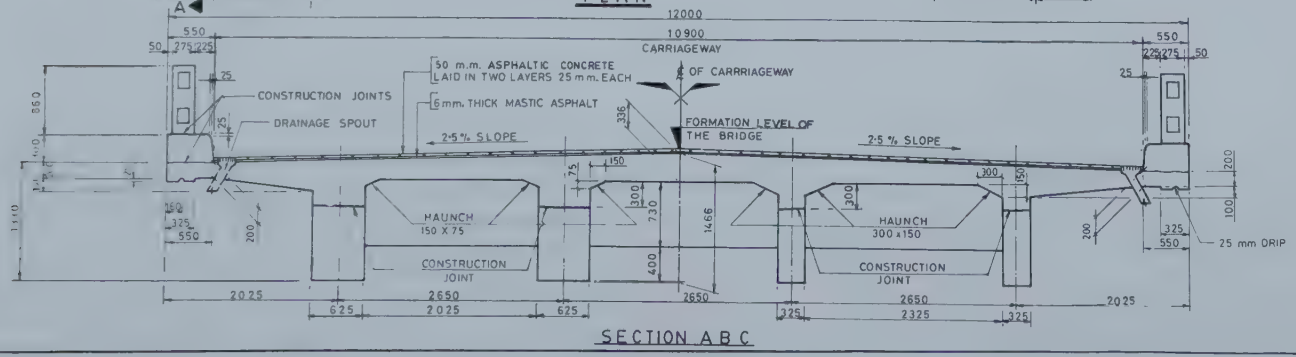


SECTION ABC

NOTES:

This drawing shall be read in conjunction with following drawings.

i) General notes Drg. No. SD/200.
ii) Details of R.C.C. railings Drg. No SD/201.
iii) Details of rocker and roller bearings.. Drg. No. SD/204.
iv) Details of miscellaneous items...Drg. No. SD/205.
v) Details of deck slab (for bridges without footpaths) ...Drg. No. SD/252.
vi) Details of longitudinal girders...Drg. No. SD/254
vii) Details of cross girders...Drg. No. SD/255.
viii) Schedule of reinforcement...Drg. No. SD/256. Sh-1 & Sh-2.

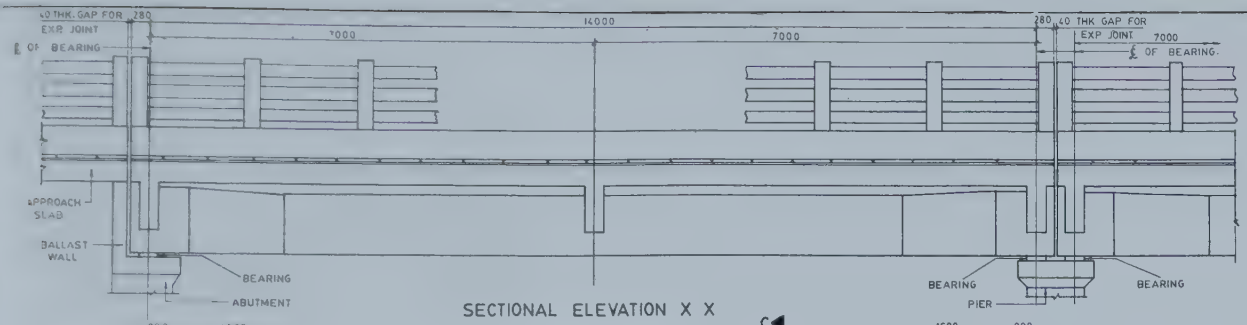
MKD.	DATE	DESCRIPTION	BY
		REVISION	

GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
('ROADS WING'), NEW DELHI

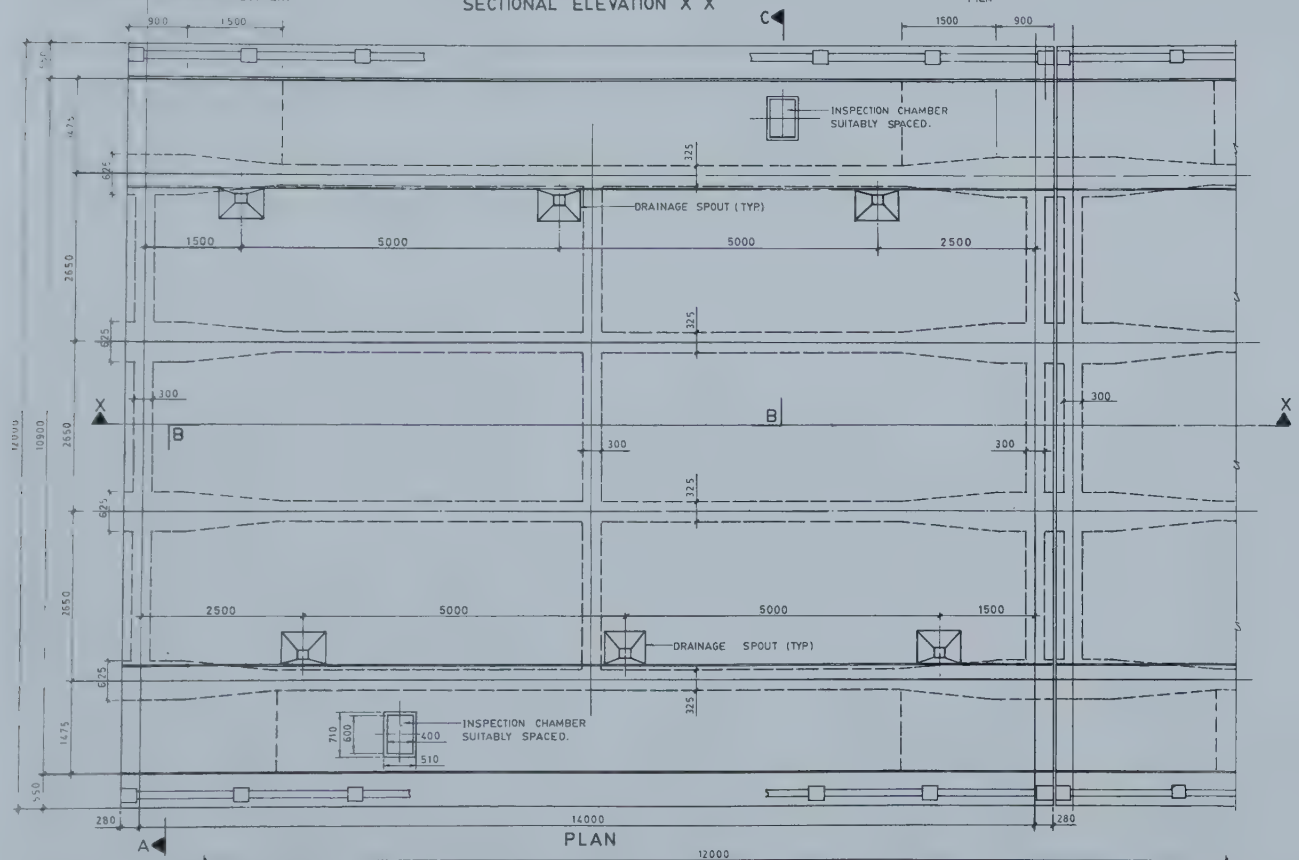
STANDARD DRAWINGS FOR ROAD BRIDGES

R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE 14·0 M. SPAN WITHOUT FOOTPATHS GENERAL ARRANGEMENT

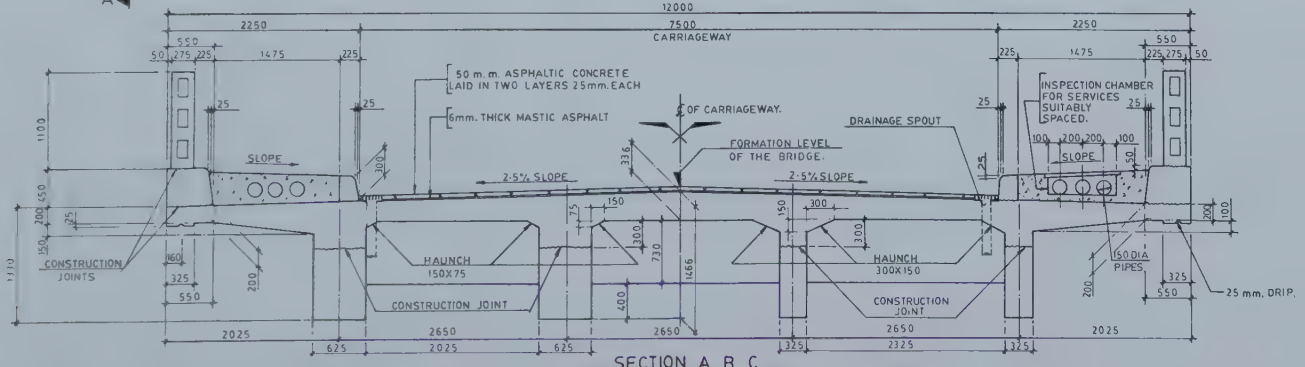
RECOMMENDED BY:		APPROVED BY	1991
) E.E.	(R.N. GHOSHAL) S.E.	(M.K. MUKHERJEE) C.E.	DRG. NO. SD/250



SECTIONAL ELEVATION X X



PLAN



SECTION A B C

DRG. NO. SD/251

NOTES:

This drawing shall be read in conjunction with following drawings.

i) General notes... Drg. No. SD/200.
ii) Details of R.C.C. railings Drg. No. SD/202.
iii) Details of rocker and roller bearings... Drg. No. SD/204.
iv) Details of miscellaneous items... Drg. No. SD/205.
v) Details of deck slab (for bridges with foot paths) Drg. No. SD/253.
vi) Details of longitudinal girders... Drg. No. SD/254.
vii) Details of cross girders... Drg. No. SD/255.
viii) Schedule of reinforcement... Drg. No. SD/257, Sh.-1 & Sh.-2

MKD.	DATE	DESCRIPTION	BY
		REVISION	

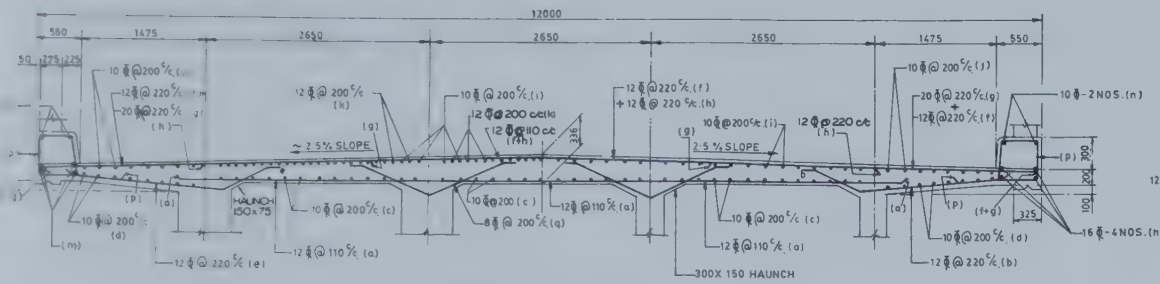
GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
(ROADS WING), NEW DELHI

STANDARD DRAWINGS FOR ROAD BRIDGES

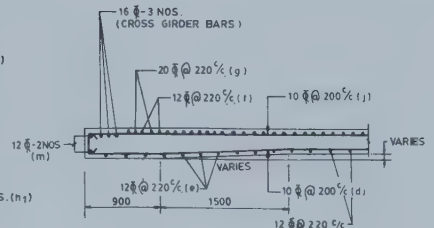
R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE
14·0 M. SPAN WITH FOOTPATHS
GENERAL ARRANGEMENT.

RECOMMENDED BY		APPROVED BY	1991
( ) E E	(R.N. GHOSHAL) S.E.	(M.K. MUKHERJEE) C.E.	DRG. NO. SD/251

DRG. NO. SD/252.



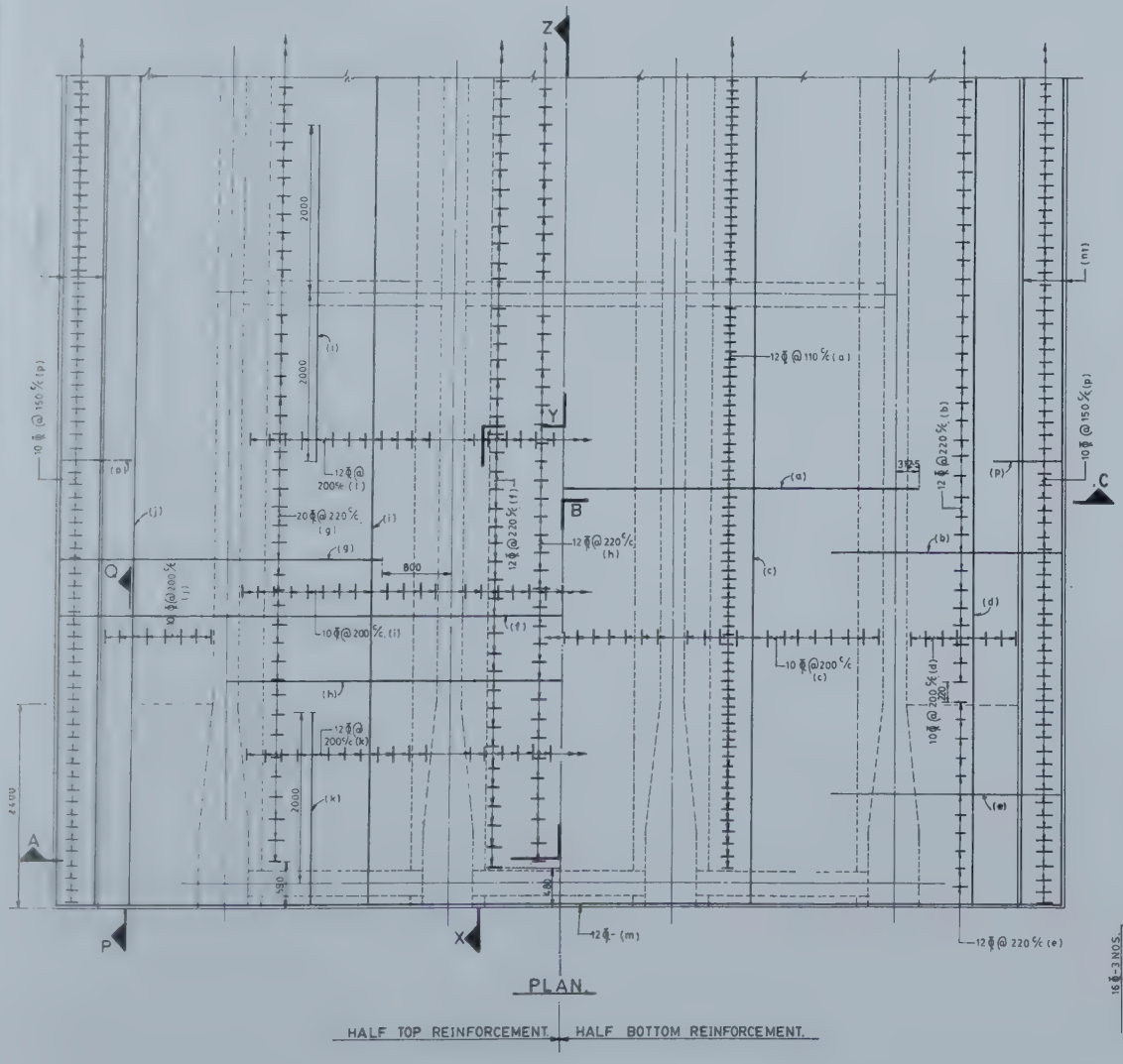
CROSS SECTION A B C.



SECTION P Q.

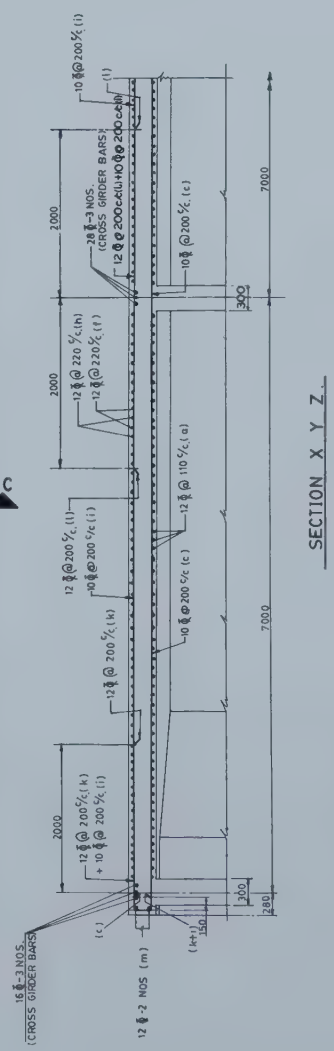
NOTES

1. The reinforcement for railing posts should be properly anchored in the deck slab befor casting the slab.
2. This drawing shall be read in conjunction with following drgs.
   - i) General notes.... Drg. No. SD/200.
   - ii) Details of R.C.C. railing.... Drg. No. SD/201
   - iii) Details of rocker and roller bearings... Drg. No. SD/204.
   - iv) Details of miscellaneous items... Drg. No. SD/205.
   - v) General arrangement (for bridges without footpaths) .... Drg. No SD/250.
   - vi) Details of longitudinal girders... Drg. No. SD/254.
   - vii) Details of cross girders.... Drg. No. SD/255.
   - viii) Schedule of reinforcement.... Drg. No. SD/256, Sh-1 & Sh-2.



PLAN.

HALF TOP REINFORCEMENT. HALF BOTTOM REINFORCEMENT.



SECTION X Y Z.

MKD	DATE.	DESCRIPTION	BY
REVISION.			

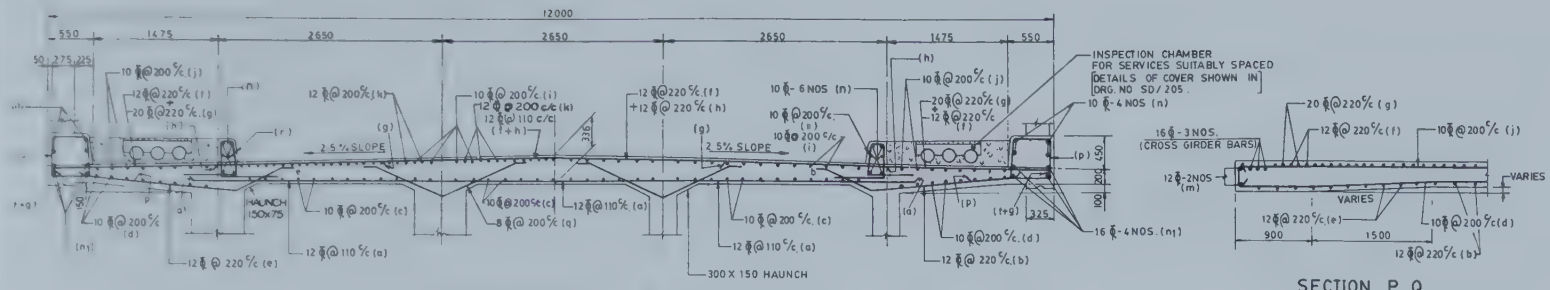
GOVERNMENT OF INDIA.
MINISTRY OF SURFACE TRANSPORT.
(ROADS WING), NEW DELHI.

STANDARD DRAWINGS FOR ROAD BRIDGES.

R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE
14·0M. SPAN WITHOUT FOOTPATHS.
DETAILS OF DECK SLAB.

RECOMMENDED BY:		APPROVED BY:	1991.
E.E.	(R.N. GHOSHAL) S.E.	(M.K. MUKHERJEE) C.E.	DRG NO. SD/252.

DRG. NO. SD/253.

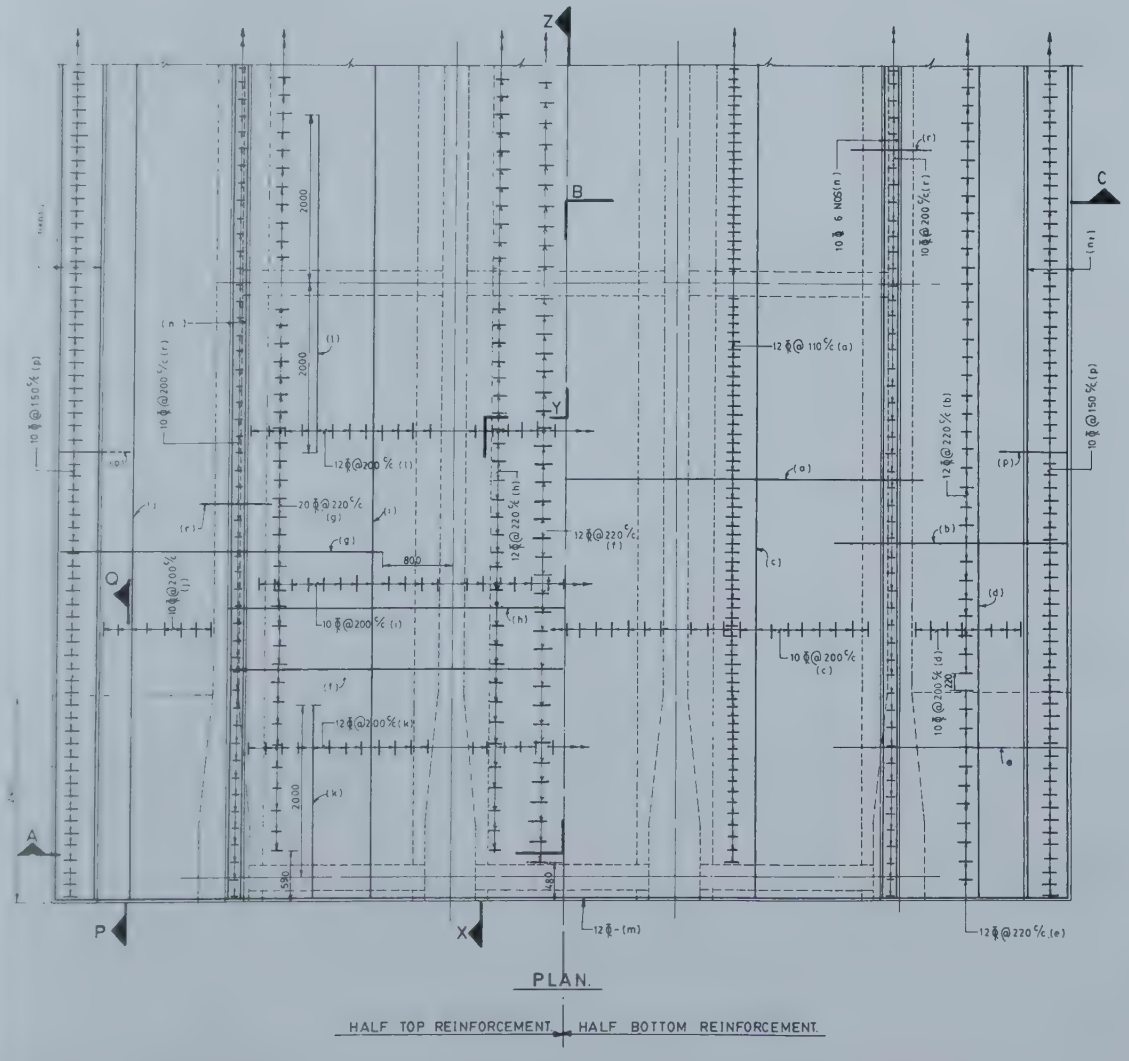


CROSS SECTION A B C

SECTION P Q.

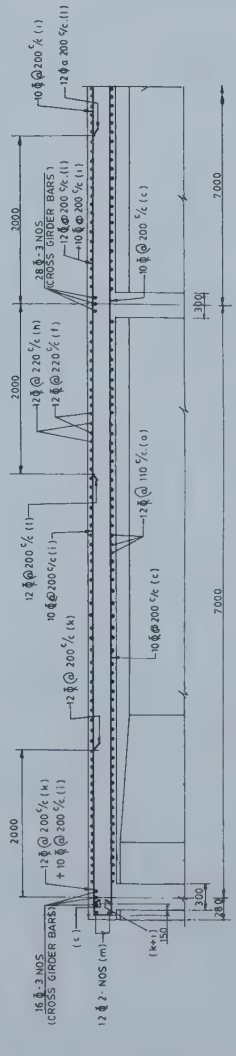
NOTES

1. The reinforcement for railing post should be properly anchored in the deck slab before casting the slab.
2. This drawing shall be read in conjunction with following drgs.
   - i) General notes....Drg. No. SD/200.
   - ii) Details of R.C.C. railing..Drg. No. SD/202.
   - iii) Details of rocker and roller bearings...Drg. No. SD/204.
   - iv) Details of miscellaneous items...Drg. No. SD/205.
   - v) General arrangement.(for bridges with footpaths)..Drg. No. SD/251.
   - vi) Details of longitudinal girders...Drg. No. SD/254.
   - vii) Details of cross girders...Drg. No. SD/255.
   - viii) Schedule of reinforcement...Drg. No. SD/257, Sh-1 & Sh-2.

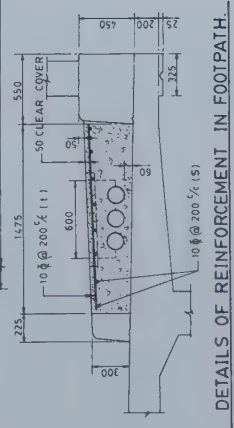


PLAN.

HALF TOP REINFORCEMENT HALF BOTTOM REINFORCEMENT.



SECTION X Y Z.



DETAILS OF REINFORCEMENT IN FOOTPATH.

MKD	DATE	DESCRIPTION	BY
REVISION			

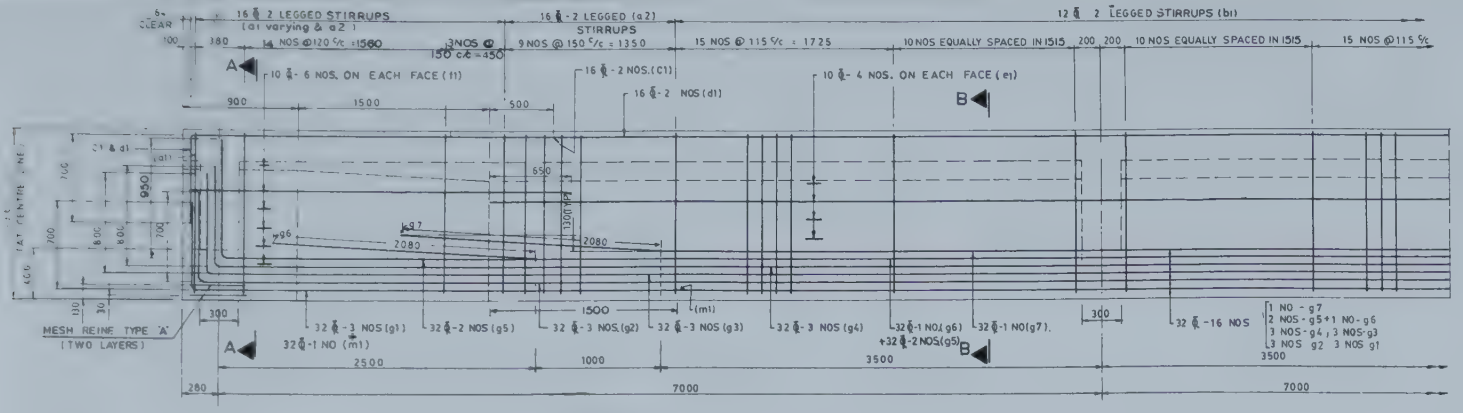
GOVERNMENT OF INDIA.
MINISTRY OF SURFACE TRANSPORT
(ROADS WING), NEW DELHI.

STANDARD DRAWINGS FOR ROAD BRIDGES.

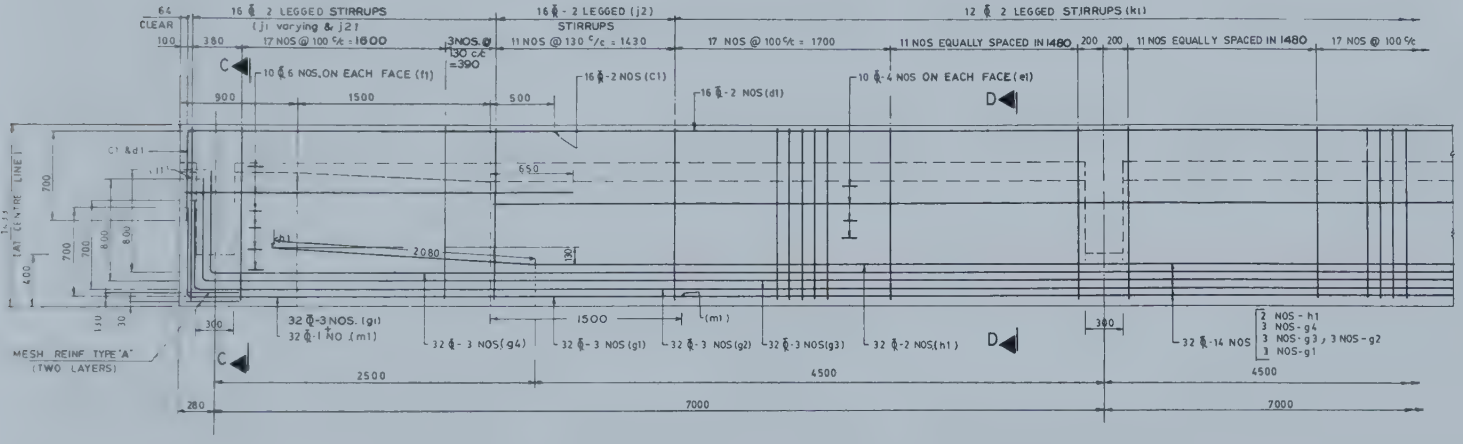
R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE 14·0 M. SPAN WITH FOOTPATHS. DETAILS OF DECK SLAB.

RECOMMENDED BY:		APPROVED BY	1991.
E E.	(R N GHOSHAL) S.E	(M.K MUKHERJEE) C.E	DRG. NO. SD/253.

DRG. NO. SD / 254


16 ϕ 2 LEGGED STIRRUPS (a1 varying & a2)
16 ϕ - 2 LEGGED (a2) STIRRUPS
12 ϕ 2 LEGGED STIRRUPS (b1)
14 NOS @ 120 c/c = 1680
3 NOS @ 150 c/c = 450
9 NOS @ 150 c/c = 1350
15 NOS @ 115 c/c = 1725
10 NOS EQUALLY SPACED IN 1515
15 NOS @ 115 c/c
10 ϕ - 6 NOS. ON EACH FACE (f1)
16 ϕ - 2 NOS.(C1)
16 ϕ - 2 NOS (d1)
10 ϕ - 4 NOS. ON EACH FACE (e1)
MESH REINF TYPE 'A' (TWO LAYERS)
32 ϕ - 3 NOS (g1)
32 ϕ - 1 NO (m1)
32 ϕ - 2 NOS (g5)
32 ϕ - 3 NOS. (g2)
32 ϕ - 3 NOS (g3)
32 ϕ - 3 NOS (g4)
32 ϕ - 1 NO (g6)
32 ϕ - 1 NO (g7).
+32 ϕ - 2 NOS (g5)
32 ϕ - 16 NOS
1 NO - g7
2 NOS - g5 + 1 NO - g6
3 NOS - g4 , 3 NOS - g3
3 NOS g2 3 NOS g1
7000

LONGITUDINAL SECTION OF OUTER GIRDER


16 ϕ 2 LEGGED STIRRUPS (j1 varying & j2)
16 ϕ - 2 LEGGED (j2) STIRRUPS
12 ϕ 2 LEGGED STIRRUPS (k1)
17 NOS @ 100 c/c = 1600
3 NOS @ 130 c/c = 390
11 NOS @ 130 c/c = 1430
17 NOS @ 100 c/c = 1700
11 NOS EQUALLY SPACED IN 1480
10 ϕ - 6 NOS. ON EACH FACE (f1)
16 ϕ - 2 NOS (C1)
16 ϕ - 2 NOS (d1)
10 ϕ - 4 NOS ON EACH FACE (e1)
MESH REINF TYPE 'A' (TWO LAYERS)
32 ϕ - 3 NOS. (g1)
32 ϕ - 1 NO (m1)
32 ϕ - 3 NOS (g4)
32 ϕ - 3 NOS (g2)
32 ϕ - 3 NOS (g3)
32 ϕ - 2 NOS (h1)
32 ϕ - 14 NOS
2 NOS - h1
3 NOS - g4
3 NOS - g3 , 3 NOS - g2
3 NOS - g1
7000

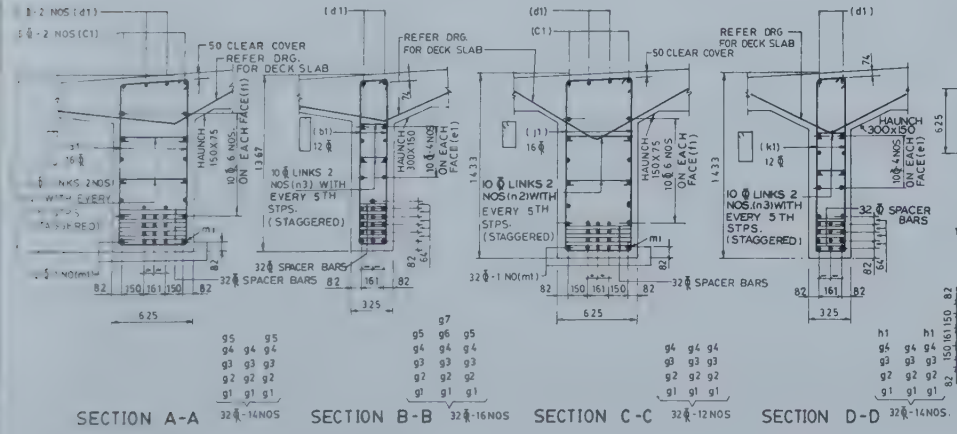
LONGITUDINAL SECTION OF INNER GIRDER

NOTES

1. Longitudinal girders shall be given upward camber on account of dead load deflection as given in the table - I
2. 32 ϕ spacer bars shall be provided @ 1 m c/c between two tiers of longitudinal bars of girders.
3. This drawing shall be read in conjunction with following drgs.

i) General notes...Drg. No. SD / 200.

ii) Details of rocker and roller bearing..Drg.No. SD/204.
iii) General arrangement (for bridges without footpaths).. Drg.No. SD / 250.
iv) General arrangement (for bridges with footpaths)Drg.No.SD/251.
v) Details of deck slab (for bridges without footpaths)... Drg. No. SD / 252.
vi) Details of deck slab (for bridges with footpaths)..Drg.No. SD/253
vii) Details of cross girders...Drg.No. SD / 255
viii) Schedule of reinforcement (for bridges without footpaths) ...Drg. No. SD / 256. Sh.-1 & Sh.-2.
ix) Schedule of reinforcement (for bridges with footpaths) Drg. No. SD / 257. Sh-1 & Sh.-2.


SECTION A-A
SECTION B-B
SECTION C-C
SECTION D-D
50 CLEAR COVER
REFER DRG. FOR DECK SLAB
10 ϕ LINKS 2 NOS (n3) WITH EVERY 5TH STPS. (STAGGERED)
32 ϕ SPACER BARS
HAUNCH 150 X 75
HAUNCH 300 X 150
10 ϕ - 6 NOS. ON EACH FACE (f1)
10 ϕ - 4 NOS ON EACH FACE (e1)
32 ϕ - 1 NO (m1)
32 ϕ - 14 NOS
32 ϕ - 16 NOS
32 ϕ - 12 NOS

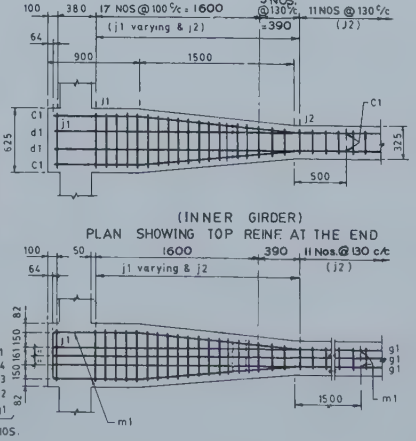
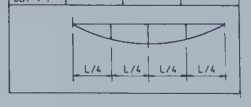
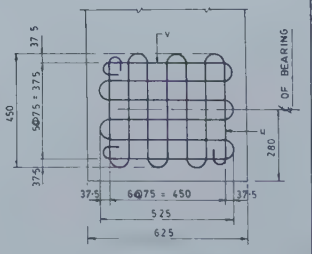

(INNER GIRDER)
PLAN SHOWING TOP REINF. AT THE END
(INNER GIRDER)
PLAN SHOWING BOTTOM REINF. AT THE END
(SIMILAR DETAILING WILL BE FOLLOWED FOR OUTER GIRDERS)

TABLE - I

	1/4 POINT	MID SPAN	1/4 POINT
BRIDGE WITH F.P	7 m m	10 m m	7 m m
BR WITH OUT F.P	6 m.m	9 m m	6 m m



DEAD LOAD DEFLECTION DIAGRAM



MKD.	DATE	DESCRIPTION	BY
		REVISION	

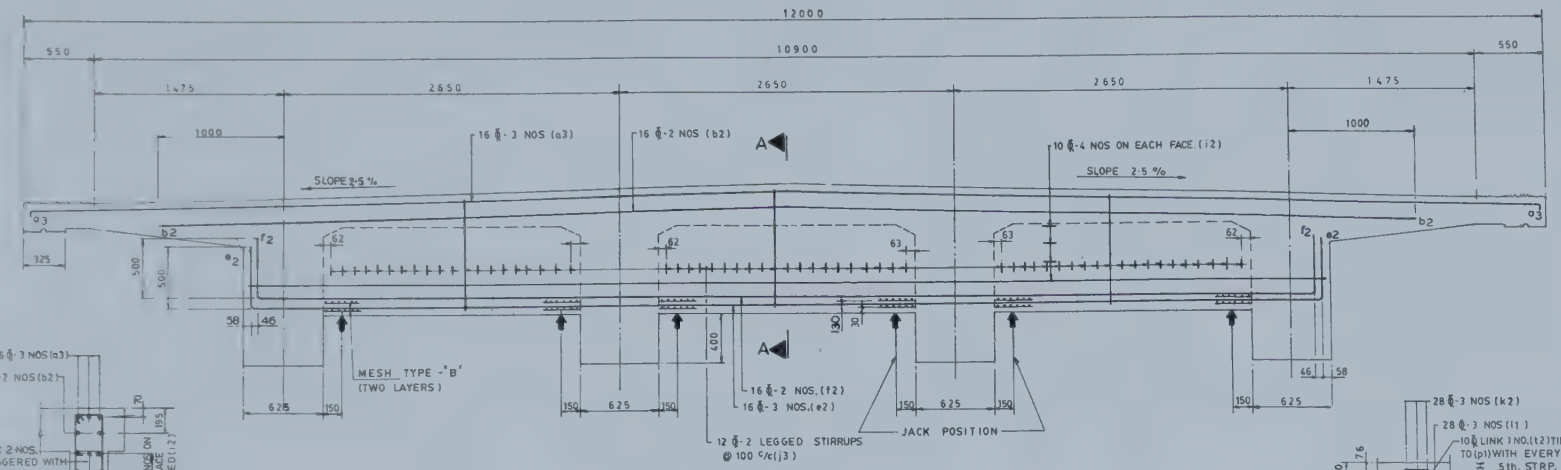
GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
(ROADS WING), NEW DELHI

STANDARD DRAWINGS FOR ROAD BRIDGES.

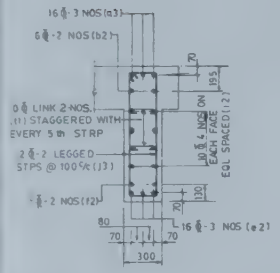
R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE
14·0 M. SPAN WITH & WITHOUT FOOTPATHS
DETAILS OF LONGITUDINAL GIRDERS.

RECOMMENDED BY :-		APPROVED BY	1991
E E	(R N GHOSAL). S.E.	(M.K. MUKHERJEE) C.E.	DRG. NO. SD / 254.

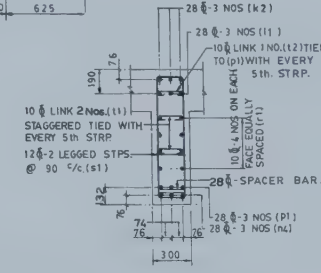
DRG. NO. SD/255



LONGITUDINAL SECTION
OF END CROSS GIRDER


16 ϕ-3 NOS (a3)
6 ϕ-2 NOS (b2)
10 ϕ LINK 2 NOS. (i1) STAGGERED WITH EVERY 5th STRP
2 ϕ-2 LEGGED STPS @ 100 c/c (j3)
2 ϕ-2 NOS (f2)
10 ϕ-4 NOS ON EACH FACE EQL SPACED (i2)
16 ϕ-3 NOS (e2)
300

SECTION A-A

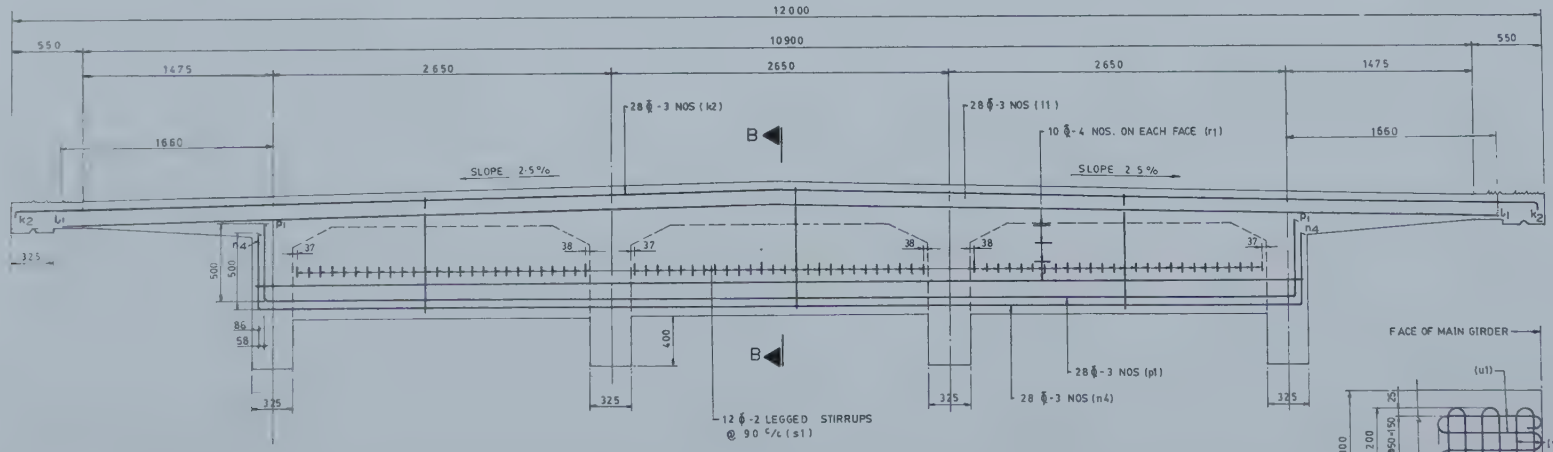

28 ϕ-3 NOS (k2)
28 ϕ-3 NOS (l1)
10 ϕ LINK 1 NO. (t2) TIED TO (p1) WITH EVERY 5th STRP.
10 ϕ LINK 2 Nos. (t1) STAGGERED TIED WITH EVERY 5th STRP.
12 ϕ-2 LEGGED STPS @ 90 c/c (s1)
10 ϕ-4 NOS ON EACH FACE EQUALLY SPACED (r1)
28 ϕ-SPACER BAR.
28 ϕ-3 NOS (p1)
28 ϕ-3 NOS (n4)
300

SECTION B-B

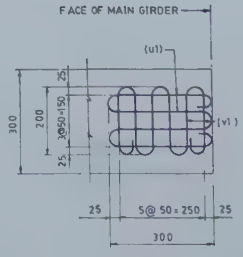
NOTES

1. The location of jacks for lifting of the superstructure to replace bearings etc. is shown thus ⬆ This shall be distinctly etched for easy identification on the end cross girder and pier/abutment caps.
2. During the lifting operation all the six jacks placed under the end cross-girder in line with the bearings shall be operated simultaneously using single operating console, grouping the pump and control system, so as to ensure that the reactions on all the six jacks are equal at all times
3. Capacity of each jack shall be not less than 25T.
4. This drawing shall be read in conjunction with the following drawings.

i) General notes... Drg. No. SD/200.
ii) Details of rocker & roller bearings... Drg. No. SD/204.
iii) General arrangement (for bridges without footpaths)... Drg. No. SD/250.
iv) General arrangement (for bridges with footpaths) Drg.No.SD/251.
v) Details of deck slab. (for bridges without footpaths)... Drg. No. SD/252.
vi) Details of deck slab (for bridges with footpaths) Drg.No.SD/253.
vii) Details of longitudinal girders... Drg. No. SD/254.
viii) Schedule of reinforcement (for bridges without footpaths) Drg. No. SD/256 Sh-1 & Sh-2
ix) Schedule of reinforcement (for bridges with footpaths) Drg. No. SD/257 Sh-1 & Sh-2



LONGITUDINAL SECTION
OF INTERMEDIATE CROSS GIRDER



8 ϕ MESH REINFORCEMENT
TYPE -'B'

MKD	DATE	DESCRIPTION	BY
		REVISION	

GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
(ROADS WING), NEW DELHI

STANDARD DRAWINGS FOR ROAD BRIDGES

R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE
14·0 M. SPAN WITH AND WITHOUT FOOTPATHS
DETAILS OF CROSS GIRDERS

RECOMMENDED BY		APPROVED BY:	1991
EE	(R.N. GHOSHAL) S E	(M K MUKHERJEE) C.E	DRG. NO. SD/255

DRG. NO. SD/256 Sh1

A) H.Y.S.D. BARS

SCHEDULE OF REINFORCEMENT (PER SPAN)

Sl No	TYPE of bars	Shape of bars (not to scale) (dimensions are in millimetres)	Dia of bars (mm)	Length of each bar (mm)	No of bars	Total length (m)	Weight (Kg)
		Slab					
1	a	8575	12	8575	122	1046·15	941·54
2	b	150, 330, R=120, 500, 740, 249, 1692, R=120, 137	12	2976	88	261·89	235·70
3	c	150, 150, L, L, 14460 — L=Varying from 109 to 212	10	14960	39	583·44	350·06
4	d	140, 9760, 140, 1502, 1502, R=100, R=100, varying from 0 to 70, 850, 850 — L=Varying from 68 to 270	10	14962	16	239·39	143·64
5	e	varying from 249 to 313, 150, varying from 530 to 700, R=120, varying from 1343 to 1692, 500, 140, varying from 177 to 198, R=120	12	2987	44	131·43	118·29
6	f	5952, 5952, R=120, 75, 75, 49	12	12054	62	747·35	672·61
7	g	3826, 120, 96	20	3946	120	473·52	1183·80
8	h	3976, 3976, LR=120, 99	12	7952	60	477·12	429·41
9	i	14460, L, L, 150, 150 — L=Varying from 109 to 212	10	14960	39	583·44	350·06
10	j	14460, L, L, 75, 75 — L=Varying from 68 to 270	10	14888	16	238·21	142·93
11	k	2230, L, 170 — L Varying from 109 to 212	12	2488	72	179·14	161·22
12	l	4000	12	4000	36	144·00	129·60
13	m	11900	12	11900	4	47·60	42·84
14	n	14460	10	14460	4	57·84	34·70
15	n1	14460	16	14460	8	115·68	185·09
16	P	405, 380, 380, 443, 500 — Varying from 37 to 54	10	2208	196	432·77	259·66
17	q	150, 150, R=80, R=80, 860, 950, 393, 433	8	2110	136	286·96	11478
		LONGITUDINAL GIRDERS					
1	a1	L2 Varying from 1229 to 1233, L2, L1 — L1 Varying from 1237 to 1241, 193 to 493	16	3476	72	250·27	400·43
2	a2	193, 1233, 1237, 193	16	3176	36	114·34	182·94
3	b1	193, 1233, 1237, 193	12	3096	100	309·60	278·64
4	c1	708, R=96, Elevation; 166, 836, 1508, 500, Plan	16	3488	16	55·81	89·30
5	d1	14432, 708, R=96, 708	16	15720	8	125·76	201·22
6	e1	9760	10	9760	32	312·32	187 39
7	f1	836, 1508, 650, 160	10	2994	96	287·42	172·45

Sl No	Type of bars	Shape of bars (not to scale) (dimensions are in millimetres)	Dia of bars (mm)	Length of each bar (mm)	No of bars	Total length (m)	Weight (kg)
8	g1	716, R=192, 716, 14432	32	15608	12	187·30	1179·99
9	g2	716, R=192, 716, 14304	32	15480	12	185·76	1170·29
10	g3	816, R=192, 816, 14176	32	15552	12	186·62	1175·71
11	g4	816, R=192, 816, 14048	32	15424	12	185·09	1166·07
12	g5	950, R=192, 950, 13920	32	15564	4	62·26	392·24
13	g6	2080, 9000, 2080, 162	32	13160	2	26·32	165·82
14	g7	2080, 7000, 2080, 162	32	11160	2	22·32	140·62
15	h1	162, 2080, 9000, 2080	32	13160	4	52·64	331 63
16	j1	L2=Varying from 1295 to 1299, L2, L1 — L1=Varying from 1303 to 1307, Varying from 193 to 493	16	3608	84	303·07	484·91
17	j2	1299, 93, 1303, 193	16	3308	44	145·55	232·88
18	k1	1299, 93, 1303, 93	12	3228	112	361·54	325·39
19	m1	836, 1508, 1500, 493, 836, 1508, 1500	32	7925	8	63·4	399·42
20	n2	140, 140 — L Varying from 213 to 513	10	583	64	37·31	22·39
21	n3	213, 140, 140	10	433	128	55·42	33·25

B) M.S. BARS (MESH IN LONGITUDINAL GIRDERS)

1	u	25, 375, 30, 30, 375, 375, 25, 75, 75, 75, 75, 75, 75	8	3550	16	56·80	22·72
2	v	30, 25, 75, 75, 75, 75, 75, 30, 37·5, 450, 25	8	3506	16	56·10	22·44

NOTES

1. Dimensions in the schedule are given as per : S: 2502-1963.
2. The exact length of the bars will be determined by the actual laps with splices adopted at site.
3. This drawing shall be read in conjunction with following drawings.
   - i) General notes ... Drg. No. SD/200.
   - ii) Details of deck slab (for bridges without footpaths). Drg. No. SD/252.
   - iii) Details of longitudinal girders .... Drg No SD/254.

MKD.	DATE.	DESCRIPTION.	BY
		REVISION	

GÓVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
(ROADS WING), NEW DELHI

STANDARD DRAWINGS FOR ROAD BRIDGES

R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE 14·0 M SPAN WITHOUT FOOTPATHS. SCHEDULE OF REINFORCEMENT

RECOMMENDED BY:		APPROVED BY:	1991
E E	(R.N. GHOSHAL) S.E.	(M.K. MUKHERJEE) C.E.	DRG. NO. SD/256 Sh1

DRG. NO.-SD/256-Sh-2

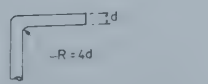
SCHEDULE OF REINFORCEMENT (PER SPAN)

A) H.Y.S.D. BARS

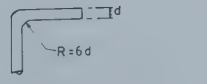
Sl. No.	Type of bars	Shape of bars (not to scale) (dimensions are in millimetres)	Dia of bars (mm.)	Length of each bar (mm.)	No. of bars	Total length (m.)	Weight (kg.)
		CROSS GIRDERS					
1	a_3	95, 5952, 5952, 95, 152	16	12094	6	72·56	116·10
2	b_2	4977, 4977, 1141	16	9954	4	39·82	63·71
3	e_2	508, R=64, 8475, 508	16	9395	6	56·37	90·19
4	f_2	508, R=64, 8383, 508	16	9303	4	37·21	59·54
5	i_2	101, R=40, 8443, 101	10	8585	16	137·36	82·42
6	l_3	B, 176 — B = Varying from 852 to 942.	12	2386	120	286·32	257·69
7	k_2	100, 5952, 5952, 100, 164	28	12104	3	36·31	174·29
8	l_1	3436, 4400, 3436, 86	28	11274	3	33·82	162·34
9	n_4	514, R=168, 8131, 514	28	8935	3	26·80	128·64
10	p_1	514, R=168, 8015, 514	28	8819	3	26·46	127·01
11	r_1	400, R=40, 8151, 400	10	8891	6	53·35	32·01
12	s_1	B, 176 — B = Varying from 848 to 942.	12	2382	78	185·80	167·22
13	t_1	140, 196, 140	10	416	96	39·94	23·96
14	t_2	170, 200, 170	12	468	18	8·42	7·58

B) M.S. BARS (MESH IN CROSS GIRDERS)

14	u_1	30, 30, 50 50 50, 25, 250, 25	8	1453	24	34·87	13·95
15	v_1	30, 30, 25, 150, 25, 50 50 50 50 50	8	1510	24	36·24	14·50



d = Dia of bar.
For bar upto 25 mm dia



d = Dia of bar
For bar above 25 mm. dia.

MAXIMUM DEAD LOAD REACTIONS (IN K.N.)

At Abutment	At Pier
1215·00	2430·00

TOTAL QUANTITY* (PER SPAN)

1. STEEL ... H.Y.S.D. BARS 16·51 T
   M.S. BARS 0·08 T
   (including 5% extra for laps and wastage)
2. CONCRETE ..... 84·32 m^3

* Excluding quantities for railing.

NOTES

1. Dimensions in the schedule are given as per IS: 2502 -1963.
2. The exact length of the bars will be determined by the actual laps/splices adopted at site.
3. This drawing shall be read in conjunction with following drawings
   i) General notes.... Drg No.-SD/200.
   ii) Details of cross girders....Drg. No.-SD/255
   iii) Schedule of reinforcement....Drg. No.-SD/256 Sh-1.

MKD.	DATE	DESCRIPTION	BY.
		REVISION.	

GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
(ROADS WING), NEW DELHI

STANDARD DRAWINGS FOR ROAD BRIDGES

R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE
14·0 M. SPAN WITHOUT FOOTPATHS
SCHEDULE OF REINFORCEMENT.

RECOMMENDED BY:		APPROVED BY:	1991
E.E.	(R. N GHOSHAL) S.E.	(M. K. MUKHERJEE) C.E.	DRG. NO. SD/256-Sh-2

SCHEDULE OF REINFORCEMENT (PER SPAN)

A) HYS.D BARS

Sl No	Type of bars	Shape of bars (not to scale) (dimensions are in millimetres)	Dia of bars (mm)	Length of each bar (m.m.)	No of bars	Total length (m.)	Weight (kg.)
		Slab / Foot path					
1	a	8575	12	8575	122	1046·15	941·54
2	b	150, 530, R=120, 1692, 500, 140, 249, 137, R=120	12	2976	88	261·89	235·70
3	c	150, 150, 14460, L=Varying from 109 to 212	10	14960	37	553·52	332·11
4	d	140, 9760, 140, 1302, 1302, R=100, R=100, 850, 850, Varying from 0 to 70, L=Varying from 68 to 270	10	14962	16	239·39	143·64
5	e	R=120, Varying from 249 to 313, 150, 530 to 700, Varying from 1543 to 1692, 500, 140, Varying from R=120 137 to 198	12	2987	44	131·43	118·29
6	f	5952, 5952, R=120, 75, 75, 149	12	12054	62	747·35	672·61
7	g	3826, 120, 96	20	3946	120	473·52	1183·80
8	h	3976, 3976, R=120, 99	12	7952	60	477·12	429·41
9	i	14460, L, L, 150, 150, L=Varying from 109 to 212.	10	14960	37	553·52	332·11
10	j	14460, L, L, 75, 75, L=Varying from 68 to 270.	10	14888	16	238·21	142·93
11	k	2230, L, 170, L=Varying from 109 to 212.	12	2488	72	179·14	161·22
12	l	4000	12	4000	36	144·00	129·60
13	m	11900	12	11900	4	47·60	42·84
14	n	14460	10	14460	20	289·20	173·52
15	n1	14460	16	14460	8	115·68	185·09
16	p	530, 405, 438, 530, 500, Varying from 37 to 54.	10	2503	196	490·59	294·35
17	q	150, 150, R=80, R=80, 860, 950, 393, 433	8	2110	136	286·96	114·78
18	r	390, 80, 390, 500, 500	10	1860	146	271·56	162·94
19	s	14460	10	14460	16	231·36	138·82
20	t	1400	10	1400	146	204·40	122·64
		Longitudinal girders					
1	a_1	L2=Varying from 1229 to 1233, L2, L1, L1=Varying from 1237 to 1241, 193 to 493.	16	3476	72	250·27	400·43
2	a_2	193, 1233, 1237, 193	16	3176	36	114·34	182·94
3	b1	193, 1233, 1237, 193	12	3096	100	309·60	278·64
4	c1	208, R=96, Elevation, 166, 836, 1508, 500, Plan	16	3488	16	55·81	89·30
5	d1	14432, 708, R=96, 708	16	15720	8	125·76	201·22
6	e1	9760	10	9760	32	312·32	187·39
7	f1	836, 1508, 550, 160	10	2994	96	287·42	172·45

Sl No	Type of bars	Shape of bars (not to scale) (dimensions are in millimetres)	Dia of bars (mm)	Length of each bar (m.m.)	No of bars	Total length (m.)	Weight (kg.)
8	g_1	716, R=192, 716, 14432	32	15608	12	187·30	1179·99
9	g_2	716, R=192, 716, 14304	32	15480	12	185·76	1170·29
10	g_3	816, R=192, 816, 14176	32	15552	12	186·62	1175·71
11	g_4	816, R=192, 816, 14048	32	15424	12	185·09	1166·07
12	g_5	950, R=192, 950, 13920	32	15564	4	62·26	392·24
13	g_6	2080, 2080, 162, 9000	32	13160	2	26·32	165·82
14	g_7	2080, 2080, 162, 7000	32	11160	2	22·32	140·62
15	h1	162, 2080, 2080, 9000	32	13160	4	52·64	331·63
16	j_1	L2=Varying from 1295 to 1299, L2, L1, L1=Varying from 1303 to 1307, Varying from 193 to 493	16	3608	84	303·07	484·91
17	j_2	193, 1299, 1303, 193	16	3308	44	145·55	232·88
18	k1	193, 1299, 1303, 193	12	3228	112	361·54	325·39
19	m1	836, 1508, 1500, 493, 836, 1508, 1500	32	7925	8	63·4	399·42
20	n_2	140, L, 140, L=Varying from 213 to 513.	10	583	64	37·31	22·39
21	n_3	213, 140, 140	10	433	128	55·42	33·25

B) M.S. BARS (MESH IN LONGITUDINAL GIRDERS)

1	u	25, 375, 375, 30, 30, 375, 375, 25, 75, 75, 75, 75, 75, 75	8	3550	16	56·80	22·72
2	v	30, 25, 75, 75, 75, 75, 30, 375, 450, 25	8	3506	16	56·10	22·44

NOTES -

1. Dimensions in the schedule are given as per I S : 2502-1963.
2. The exact length of the bars will be determined by the actual laps with splices adopted at site.
3. This drawing shall be read in conjunction with following drawings :

i) General notes... Drg. No. SD/200.
ii) Details of deck slab (for bridges with foot paths)... Drg. No. SD/253.
iii) Details of longitudinal girders... Drg. No. SD/254.

MKD.	DATE	DESCRIPTION	BY
		REVISION.	

GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT.
(ROADS WING), NEW DELHI.

STANDARD DRAWINGS FOR ROAD BRIDGES.

R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE
14·0M. SPAN WITH FOOTPATHS
SCHEDULE OF REINFORCEMENT.

RECOMMENDED BY:		APPROVED BY:	1991
E E	(R.N GHOSAL) S E	(M.K MUKHERJEE) C. E	ORG NO SD/257 Sh.1

DRG. NO.-SD/257-Sh-2

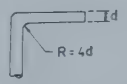
SCHEDULE OF REINFORCEMENT (PER SPAN)

A) H.Y.S.D. BARS

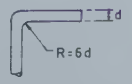
Sl. No.	Type of bars	Shape of bars (not to scale) (dimensions are in millimetres)	Dia of bars (mm.)	Length of each bar (mm.)	No. of bars	Total length (m.)	Weight (kg.)
		CROSS GIRDERS					
1	a_3	5952, 5952, 152, 95	16	12094	6	72·56	116·10
2	b_2	4977, 4977, 141	16	9954	4	39·82	63·71
3	e_2	R=64, 508, 8475, 508	16	9395	6	56·37	90·19
4	f_2	R=64, 508, 8383, 508	16	9303	4	37·21	59·54
5	t_2	R=40, 101, 8443, 101	10	8585	16	137·36	82·42
6	l_3	B, 176 — B = Varying from 852 to 942.	12	2386	120	286·32	257·69
7	k_2	5952, 5952, 100, 100, 164	28	12104	3	36·31	174·29
8	l_1	3436, 4400, 3436, 86	28	11274	3	33·82	162·34
9	n_4	R=168, 514, 8131, 514	28	8935	3	26·80	128·64
10	p_1	R=168, 514, 8015, 514	28	8819	3	26·46	127·01
11	r_1	R=40, 400, 8151, 400	10	8891	6	53·35	32·01
12	s_1	B, 176 — B = Varying from 848 to 942	12	2382	78	185·80	167·22
13	t1	140, 196, 140	10	416	96	39·94	23·96
14	t2	200, 170, 170	12	468	18	8·42	7·58

B) M.S. BARS (MESH IN CROSS GIRDERS)

14	u_1	30, 30, 50 50 50, 25, 250, 25	8	1453	24	34·87	13·95
15	v_1	30, 30, 25, 150, 25, 50 50 50 50 50	8	1510	24	36·24	14·50



d = Dia of bar
For bar upto 25 mm dia



d = Dia of bar
For bar above 25mm. dia.

MAXIMUM DEAD LOAD REACTIONS (in K.N.)

At Abutment	At Pier
1401·00	2803·00

TOTAL QUANTITY* (PER SPAN)

1 STEEL .... H.Y.S.D. BARS ... ... 17·10 T.
M.S. BARS .. . . 0·08 T.
(including 5% extra for laps and wastage)

2.(i) CONCRETE ... ... 102·22 m^3

* Excluding quantities for railing.

NOTES

1. Dimensions in the schedule are given as per IS: 2502 - 1963.
2. The exact length of the bars will be determined by the actual laps/splices adopted at site.
3. This drawing shall be read in conjunction with following drawings
   - i) General notes... Drg. No. SD/200.
   - ii) Details of cross girders... Drg. No. SD/255.
   - iii) Schedule of reinforcement... Drg. No. SD/257-Sh-1.

MKD	DATE	DESCRIPTION	Sr.
		REVISION	

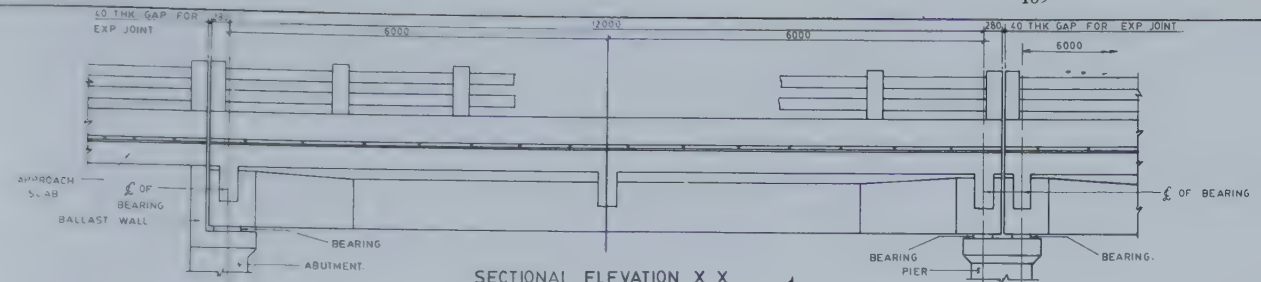
GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
(ROADS WING), NEW DELHI

STANDARD DRAWINGS FOR ROAD BRIDGES.

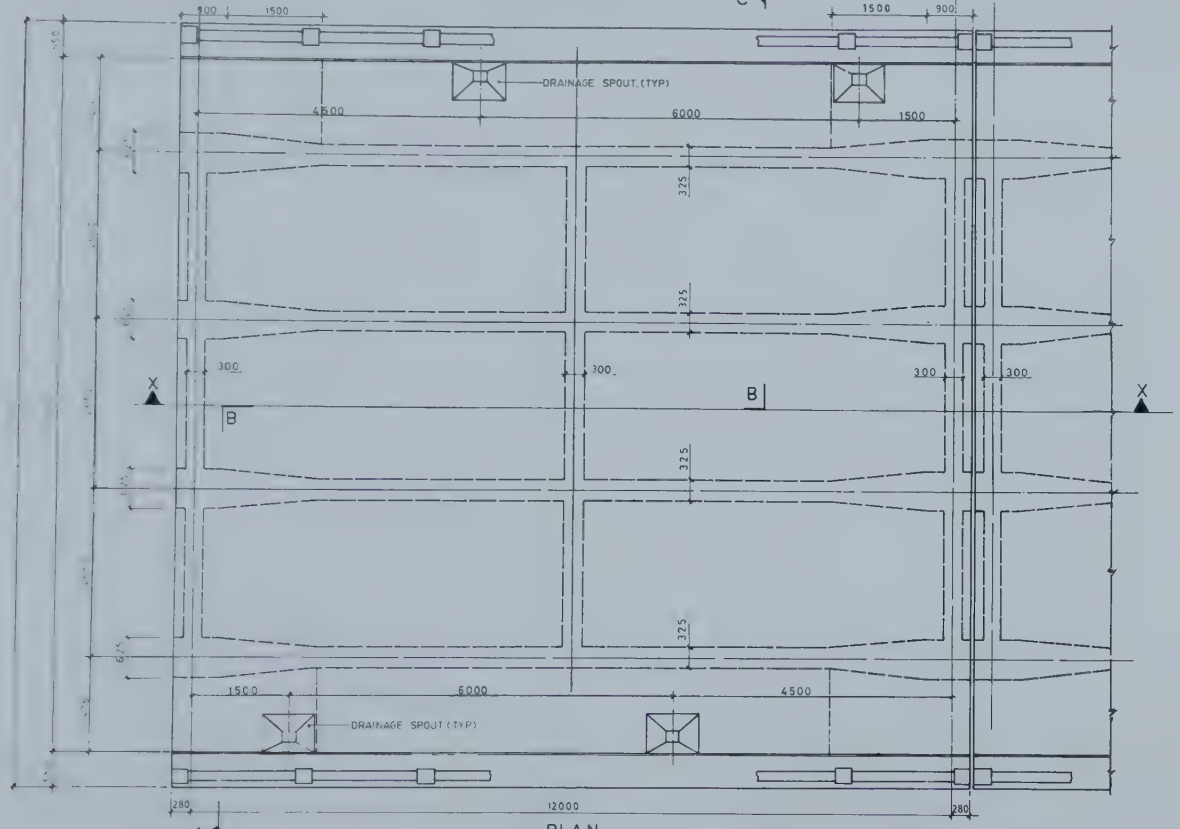
R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE
14·0 M. SPAN WITH FOOTPATHS.

SCHEDULE OF REINFORCEMENT.

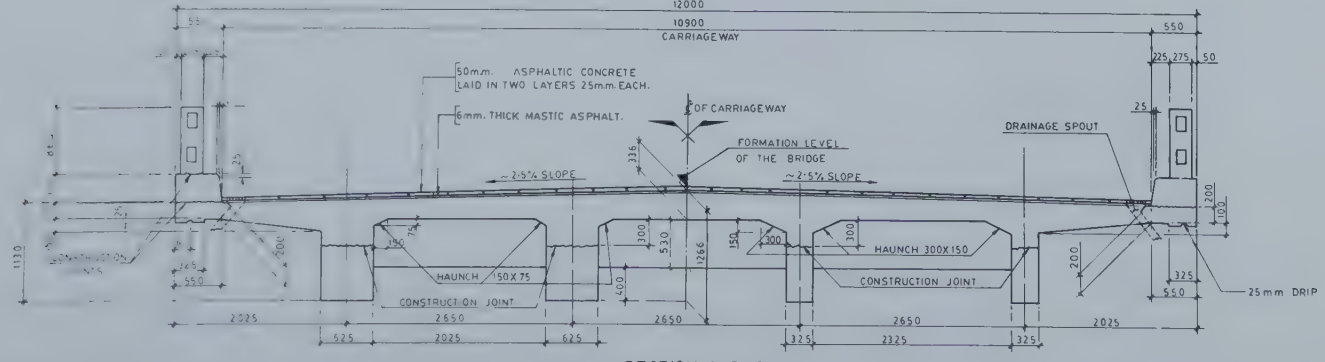
RECOMMENDED BY		APPROVED BY	1991
E E.	(R. N. GHOSAL). S E	(M K MUKHERJEE). C E	DRG. NO. SD/257-Sh-2



SECTIONAL ELEVATION X X.



PLAN



SECTION A B C

DRG. NO. SD/260

NOTES:

This drawing shall be read in conjunction with following drawings.

i) General notes...Drg. No. SD/200.
ii) Details of R.C.C. railing (for bridges without footpaths) ...Drg. No. SD/201.
iii) Details of rocker and roller bearings...Drg. No. SD/204.
iv) Details of miscellaneous items...Drg. No. SD/205.
v) Details of deck slab (for bridges without footpaths)... Drg. No. SD/262.
vi) Details of longitudinal girders...Drg. No. SD/264
vii) Details of cross girders...Drg. No. SD/265.
viii) Schedule of reinforcement..Drg. No.- SD/266 Sh-1 & Sh.-2.

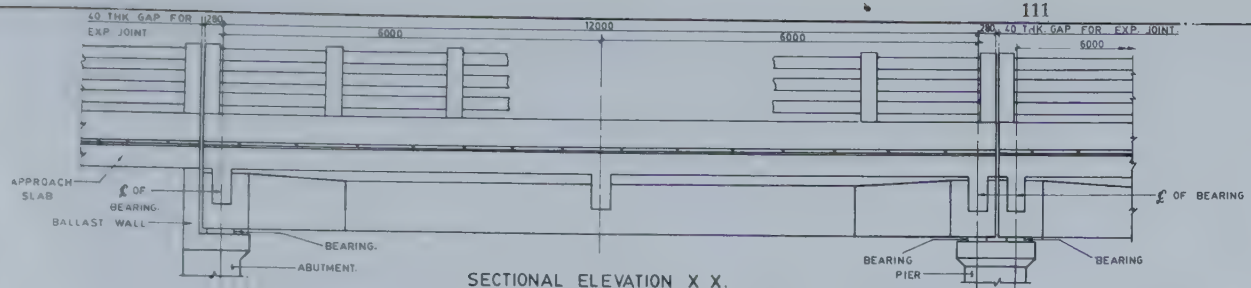
MKD.	DATE	DESCRIPTION	BY
		REVISION	

GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
(ROADS WING), NEW DELHI

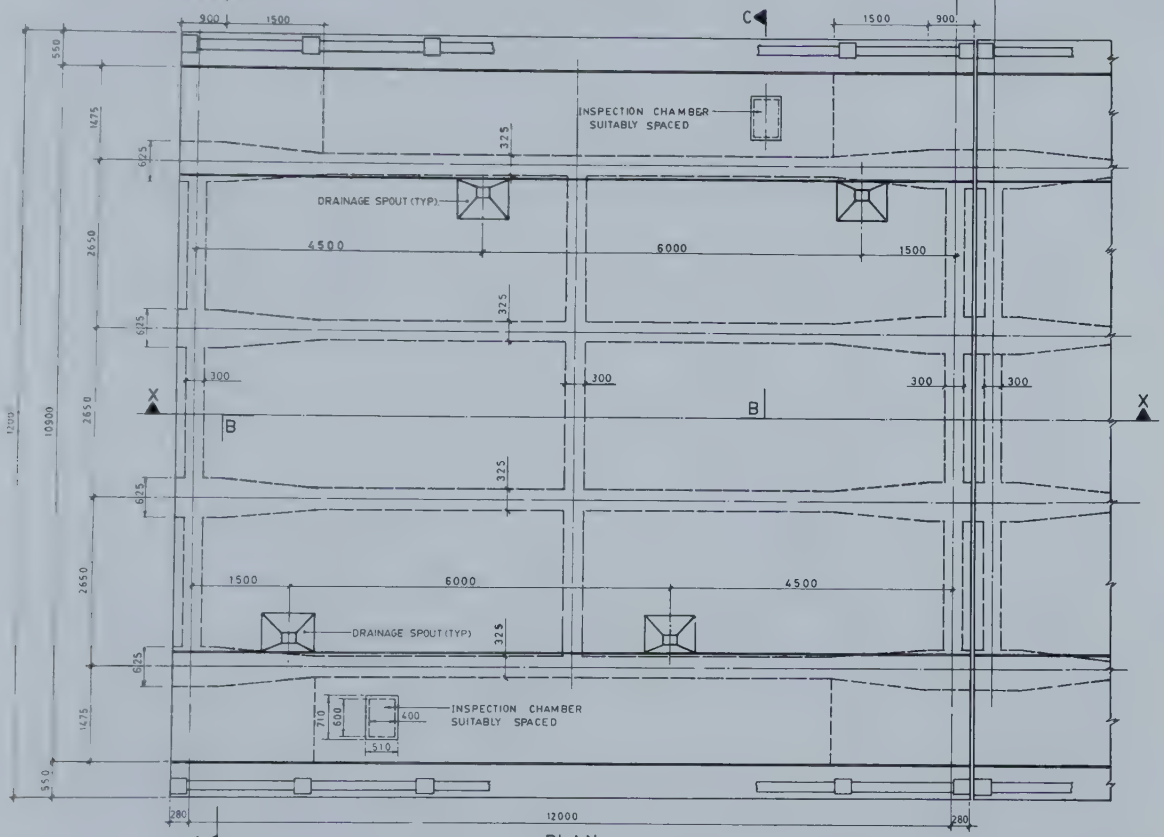
STANDARD DRAWINGS FOR ROAD BRIDGES

R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE 12·0 M. SPAN WITHOUT FOOTPATHS. GENERAL ARRANGEMENT.

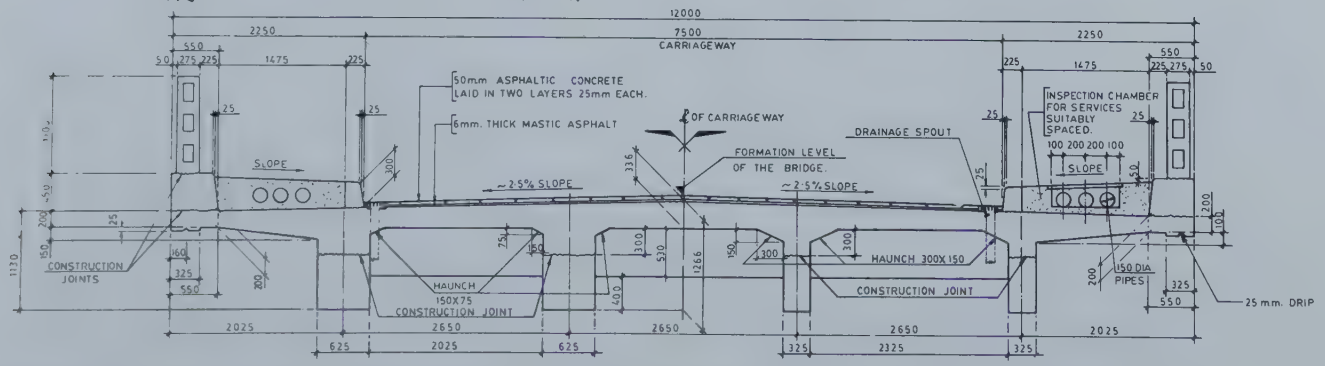
RECOMMENDED BY:		APPROVED BY:	1981
(A N DHODAPKAR) E.E.	(N.K. SINHA) S.E	(M K MUKHERJEE) C.E	DRG. NO. SD/260



SECTIONAL ELEVATION X X.



PLAN.



SECTION A B C.

DRG. NO. SD/261

NOTES:

This drawing shall be read in conjunction with following drawings.

i) General notes...Drg. No. SD/200.
ii) Details of R.C.C. railing (for bridges with footpaths) .Drg. No. SD/202.
iii) Details of rocker and roller bearings...Drg. No. SD/204.
iv) Details of miscellaneous items...Drg. No. SD/205.
v) Details of deck slab (for bridges with foot paths) Drg. No. SD/263.
vi) Details of longitudinal girders....Drg. No. SD/264.
vii) Details of cross girders...Drg. No. SD/265.
viii) Schedule of reinforcements (for bridges with footpaths) ....Drg. No. SD/267 Sh-1& Sh-2.

MKD.	DATE	DESCRIPTION	BY
		REVISION.	

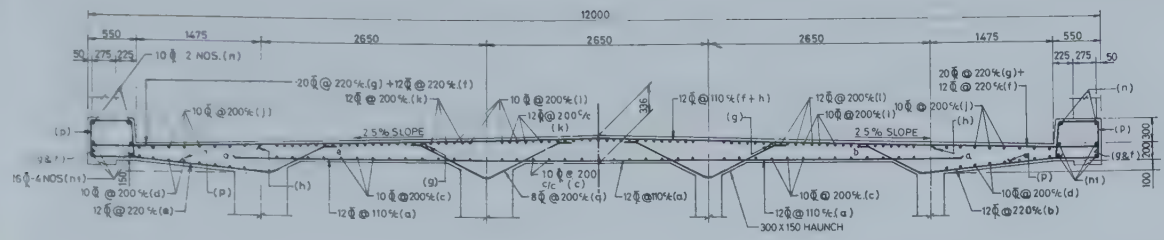
GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
(ROADS WING), NEW DELHI

STANDARD DRAWINGS FOR ROAD BRIDGES

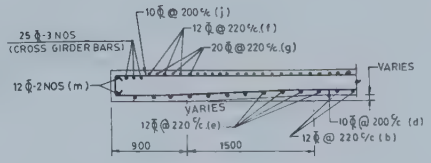
R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE 12·0 M. SPAN WITH FOOTPATHS. GENERAL ARRANGEMENT.

RECOMMENDED BY:		APPROVED BY:	1991
(A.N. DHODAPKAR) E.E.	(N.K. SINHA). S.E.	(M.K. MUKHERJEE) C.E.	DRG. NO. SD/261

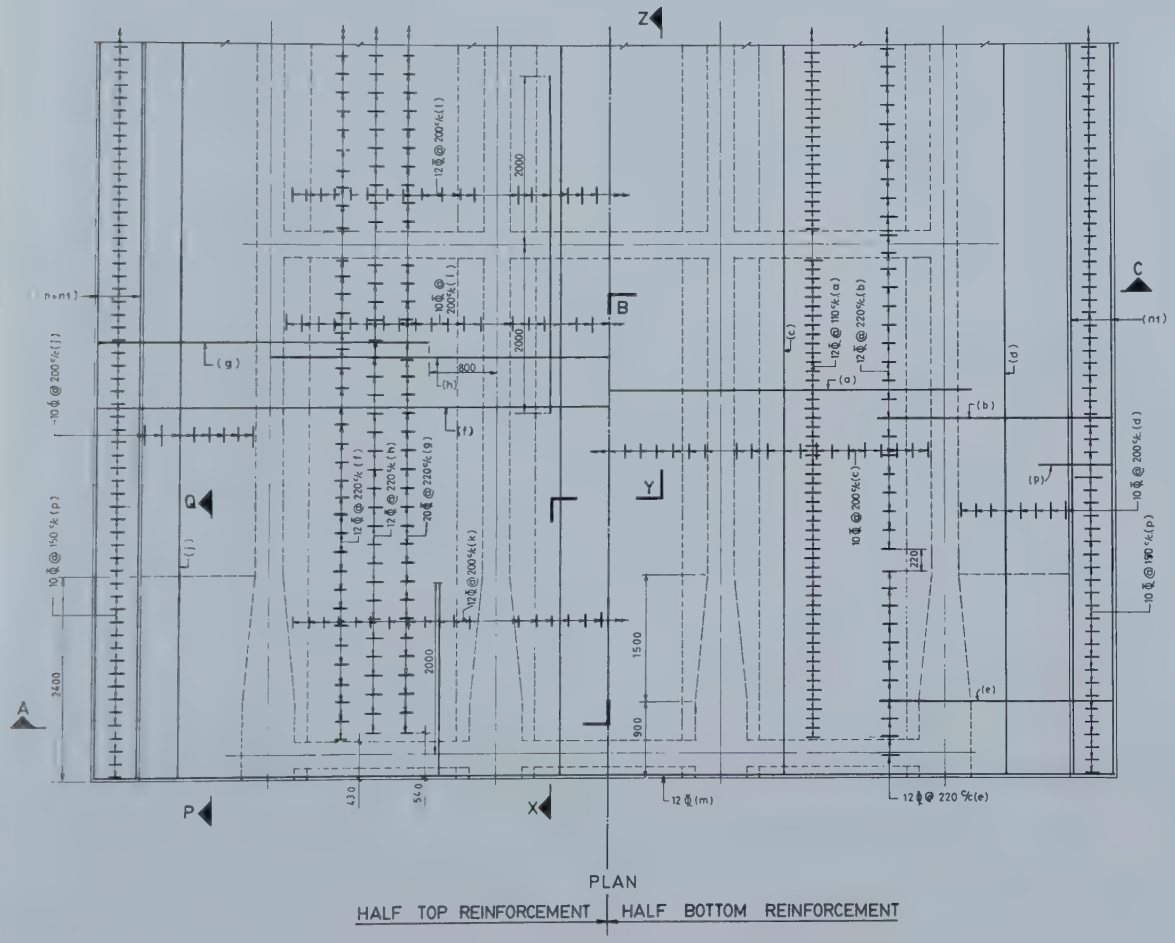
DRG. NO. SD/262



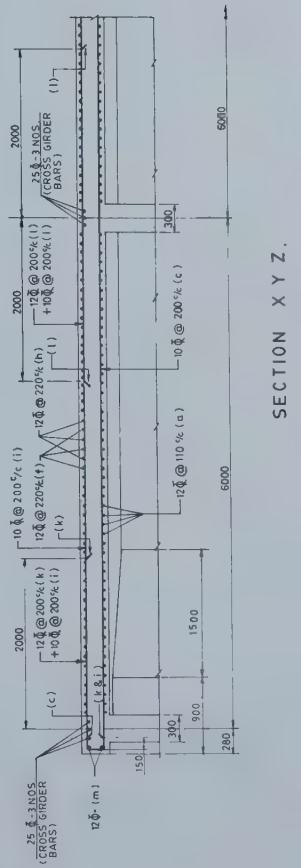
CROSS SECTION A B C.



SECTION P Q.



HALF TOP REINFORCEMENT | HALF BOTTOM REINFORCEMENT



SECTION X Y Z.

NOTES

1. The reinforcement for railing posts should be properly anchored in the deck slab before casting the slab.
2. This drawing shall be read in conjunction with following drawings.
   i) General notes...Drg.No. SD/200.
   ii) Details of R.C.C. railing Drg. No. SD/201.
   iii) Details of rocker and roller bearings...Drg. No. SD/204.
   iv) Details of miscellaneous items....Drg. No. SD/205.
   v) General arrangement (for bridges without footpaths)...Drg. No. SD/260.
   vi) Details of longitudinal girders....Drg. No. SD/264
   vii) Details of cross girders...Drg. No. SD/265.
   viii) Schedule of reinforcement...Drg. No. SD/266, Sh-1 & Sh-2

MKD	DATE	DESCRIPTION	BY
REVISION			

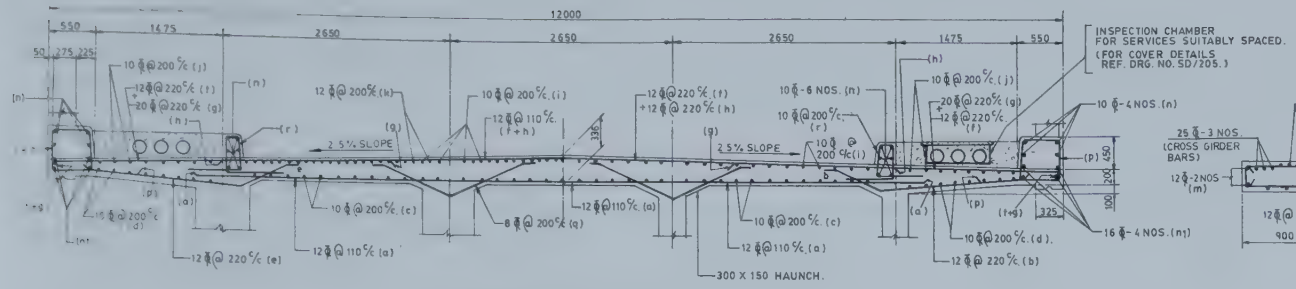
GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
(ROADS WING), NEW DELHI

STANDARD DRAWINGS FOR ROAD BRIDGES

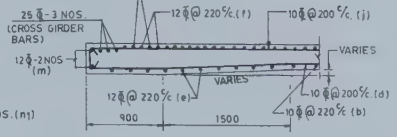
R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE
12·0 M. SPAN WITHOUT FOOTPATHS.
DETAILS OF DECK SLAB

RECOMMENDED BY:		APPROVED BY:	1991
(A.N. DHODAPKAR) E.E	(N.K. SINHA) S.E	(M.K. MUKHERJEE) C.E	DRG. NO. SD/262.

DRG. NO. SD/263.



CROSS SECTION A B C.

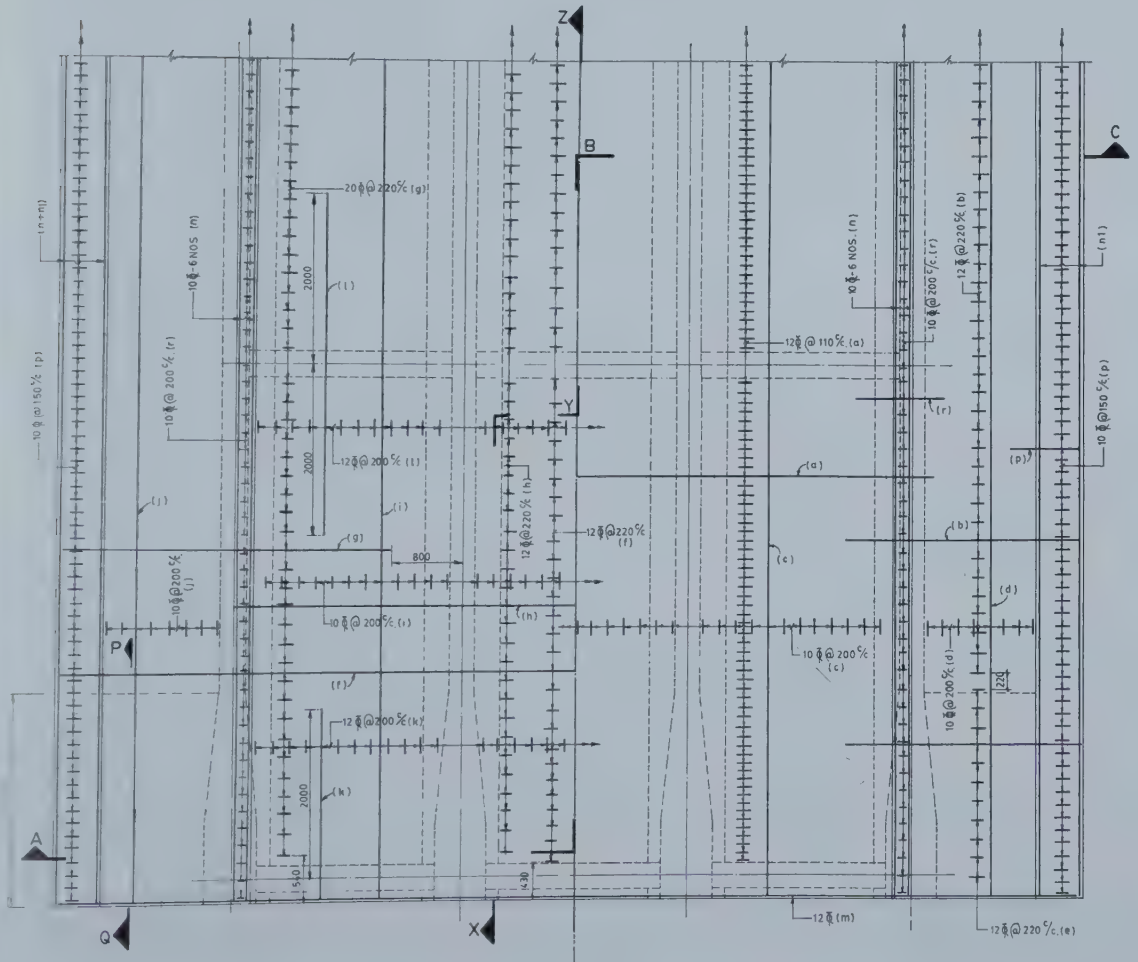


SECTION P Q.

NOTES :-

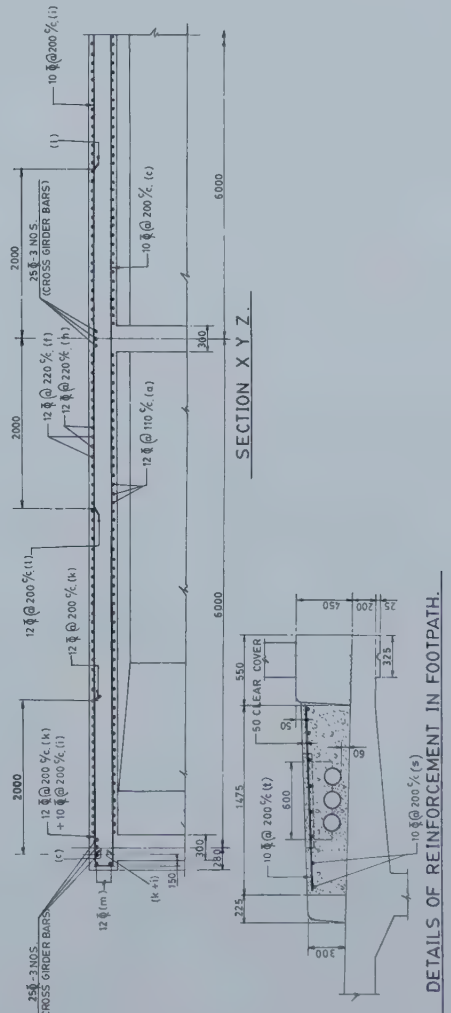
1. The reinforcement for railing posts should be properly anchored in the deck slab before casting the slab.
2. This drawing shall be read in conjunction with following drgs.

i) General notes... Drg. No. SD/200.
ii) Details of R.C.C. railing... Drg. No. SD/202.
iii) Details of rocker and roller bearings... Drg. No. SD/204.
iv) Details of miscellaneous items... Drg. No. SD/205.
v) General arrangement (for bridges with footpaths)... Drg. No. SD/261.
vi) Details of longitudinal girders... Drg. No. SD/264.
vii) Details of cross girders... Drg. No. SD/265.
viii) Schedule of reinforcement... Drg. No. SD/267, Sh-1 & Sh-2.



PLAN.

HALF TOP REINFORCEMENT HALF BOTTOM REINFORCEMENT.



DETAILS OF REINFORCEMENT IN FOOTPATH.

MKD.	DATE	DESCRIPTION	BY
		REVISION.	

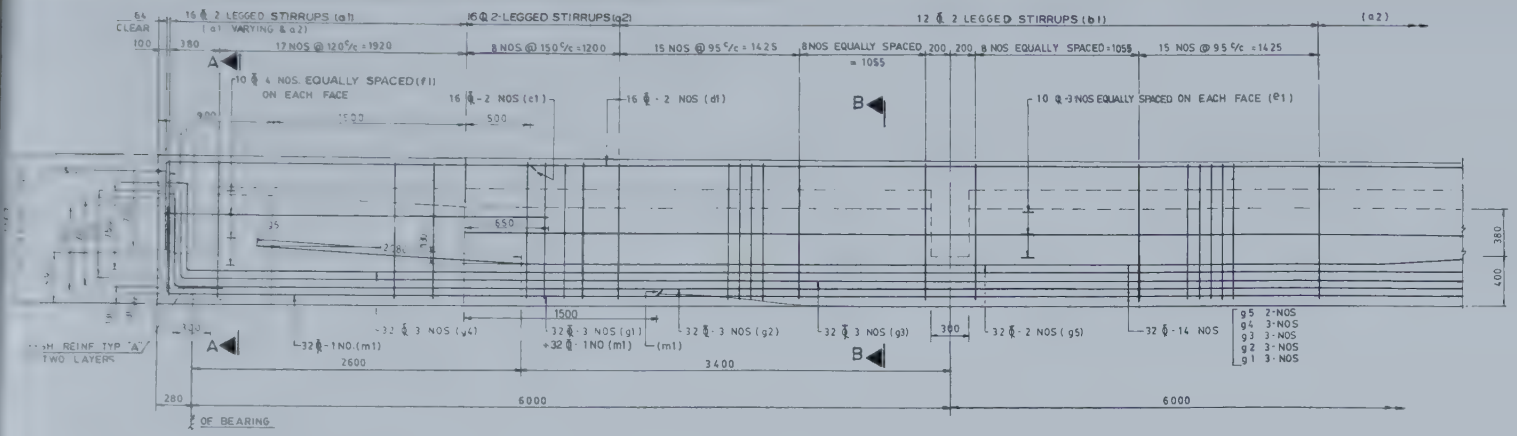
GOVERNMENT OF INDIA.
MINISTRY OF SURFACE TRANSPORT
(ROADS WING), NEW DELHI

STANDARD DRAWINGS FOR ROAD BRIDGES

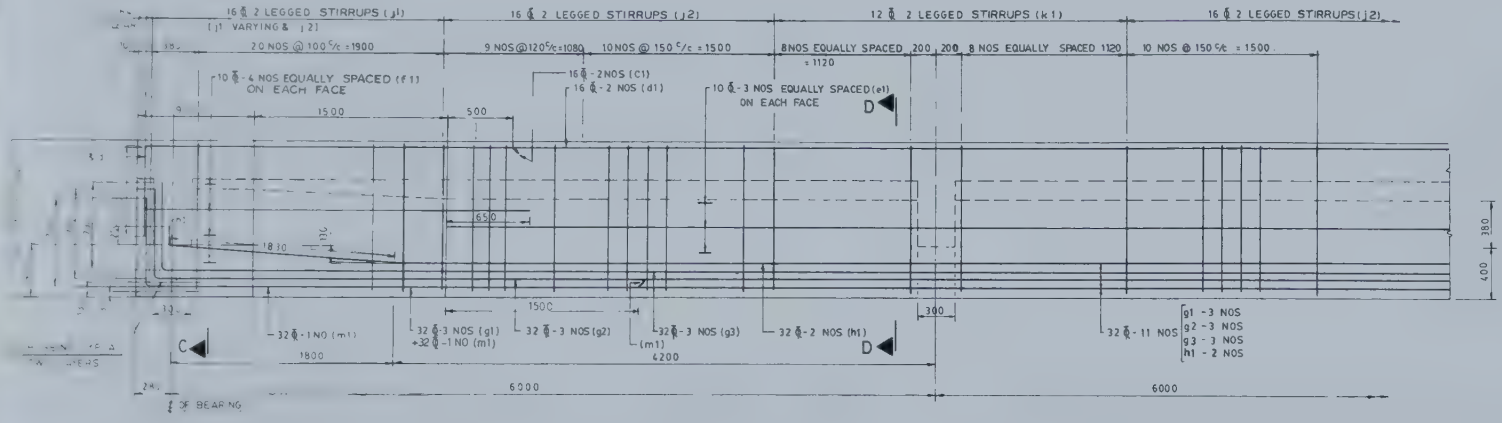
R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE 12·0 M. SPAN WITH FOOTPATHS. DETAILS OF DECK SLAB.

RECOMMENDED BY		APPROVED BY	1991
(A N DHODAPKAR) E.E.	(N K SINHA) S E	(M K MUKHERJEE) C E	DRG NO SD/263.

DRG. NO. SD/264



LONGITUDINAL SECTION OF OUTER GIRDER


16 ϕ 2 LEGGED STIRRUPS (j1) (j1 VARYING & j2)
16 ϕ 2 LEGGED STIRRUPS (j2)
12 ϕ 2 LEGGED STIRRUPS (k1)
16 ϕ 2 LEGGED STIRRUPS (j2)
20 NOS @ 100 c/c = 1900
9 NOS @ 120 c/c = 1080
10 NOS @ 150 c/c = 1500
8 NOS EQUALLY SPACED 200 200 8 NOS EQUALLY SPACED 1120
= 1120
10 NOS @ 150 c/c = 1500
10 ϕ - 4 NOS EQUALLY SPACED (f1) ON EACH FACE
16 ϕ - 2 NOS (C1)
16 ϕ - 2 NOS (d1)
10 ϕ - 3 NOS EQUALLY SPACED (e1) ON EACH FACE
D
1500
500
650
380
400
32 ϕ - 1 NO (m1)
32 ϕ - 3 NOS (g1)
+32 ϕ - 1 NO (m1)
32 ϕ - 3 NOS (g2)
(m1)
32 ϕ - 3 NOS (g3)
32 ϕ - 2 NOS (h1)
300
32 ϕ - 11 NOS
g1 - 3 NOS
g2 - 3 NOS
g3 - 3 NOS
h1 - 2 NOS
1800
4200
6000
6000
OF BEARING

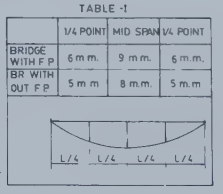
LONGITUDINAL SECTION OF INNER GIRDER

NOTES

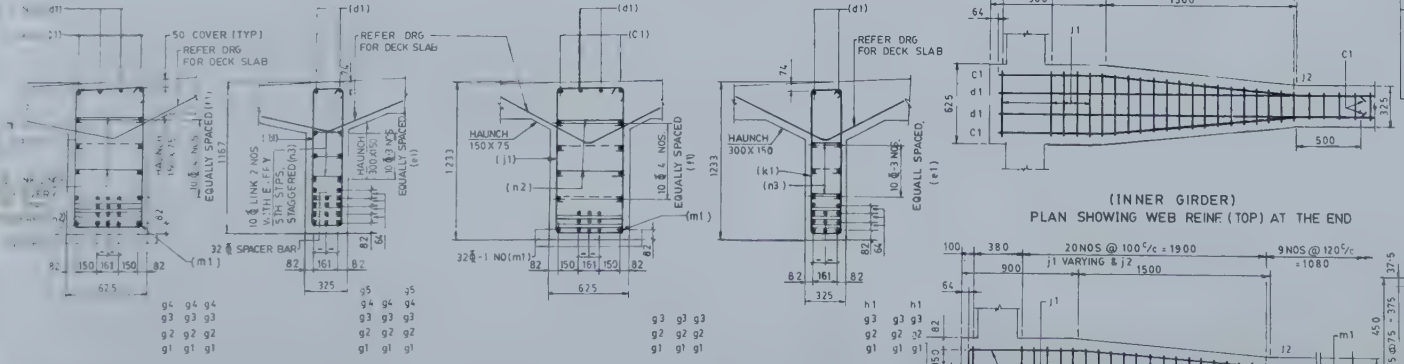
1. Longitudinal girders shall be given upward camber on account of dead load deflection as given in the table -I
2. 32 ϕ spacer bars shall be provided @ 1m. c/c. between two tiers of longitudinal bars of girders.
3. This drawing shall be read in conjunction with following drawings
   i) General notes... Drg. No. SD/200.
   ii) Details of roller and rocker bearing... Drg. No. SD/204.
   iii) General arrangement (for bridges without footpaths) Drg. No. SD/260
   iv) General arrangement (for bridges with footpaths) .. Drg. No. SD/261
   v) Details of deck slab (for bridges without footpaths) Drg. No. SD/262.
   vi) Details of deck slab (for bridges with footpaths)... Drg. No. SD/263
   vii) Details of cross girders... Drg. No. SD/265
   viii) Schedule of reinforcement (for bridges without footpaths) Drg. No. SD/266. Sh-1 & Sh-2.
   ix) Schedule of reinforcement (for bridges with footpaths) Drg. No. SD/267. Sh-1 & Sh-2.

TABLE -I

	1/4 POINT	MID SPAN	1/4 POINT
BRIDGE WITH F P	6 m m.	9 m m.	6 m.m.
BR WITH OUT F P	5 m m	8 m.m.	5 m.m

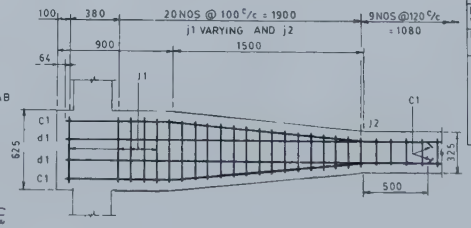


DEAD LOAD DEFLECTION DIAGRAM

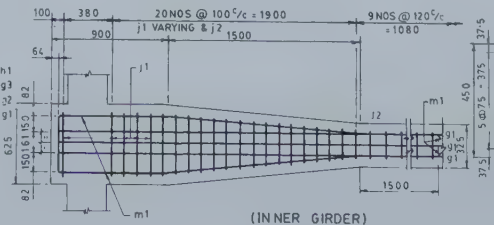

50 COVER (TYP)
REFER DRG FOR DECK SLAB
(d1)
(C1)
HAUNCH 150 X 75 (j1)
(n2)
HAUNCH 300 X 150
(k1)
(n3)
10 ϕ LINK 2 NOS WITH ENDS 5TH STIPS STAGGERED (n3)
32 ϕ SPACER BAR
(m1)
32 ϕ - 1 NO (m1)
10 ϕ - 4 NOS EQUALLY SPACED (f1)
10 ϕ - 3 NOS EQUALLY SPACED (e1)
g5 g4 g4 g4 g3 g3 g3 g2 g2 g2 g1 g1 g1
h1 h1 h1 g3 g3 g3 g2 g2 g2 g1 g1 g1

SECTION A-A SECTION B-B SECTION C-C SECTION D-D

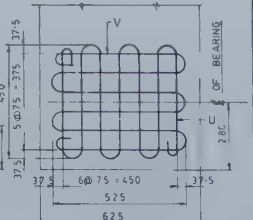
(h1 bars not shown)



(INNER GIRDER)
PLAN SHOWING WEB REINF (TOP) AT THE END



(INNER GIRDER)
PLAN SHOWING WEB REINF (BOTTOM) AT THE END
(SIMILAR SCHEME OF DETAILING WILL BE FOLLOWED FOR OUTER GIRDERS)



8 ϕ MESH REINFORCEMENT TYPE "A"

MKD	DATE	DESCRIPTION	BY
		REVISION	

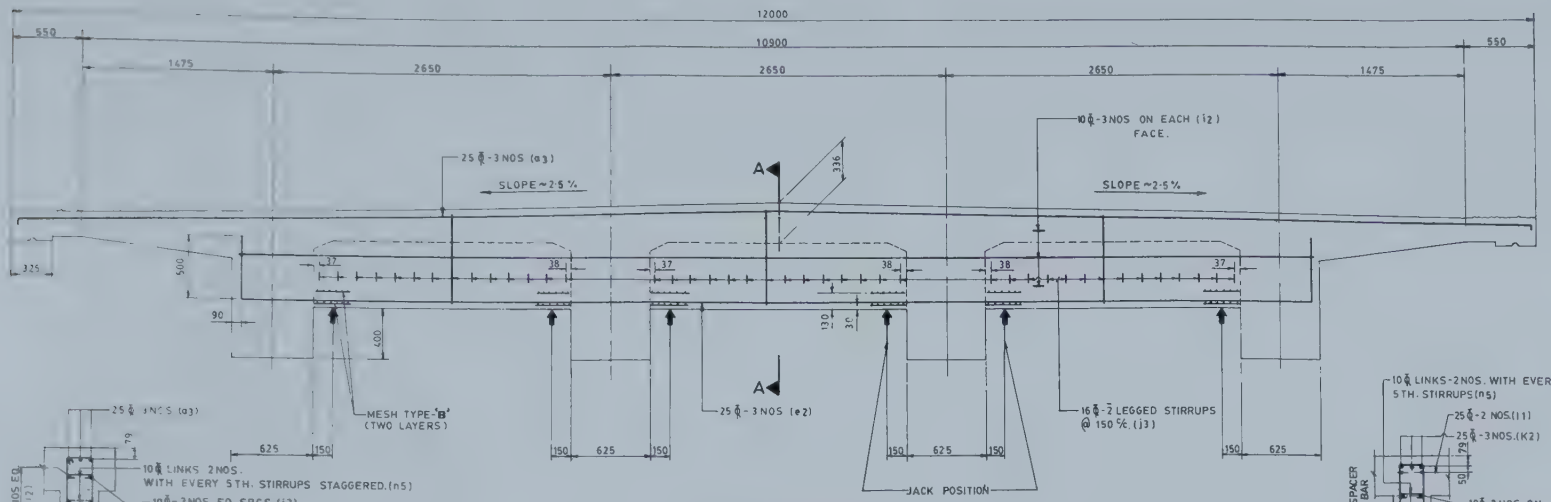
GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
(ROADS WING), NEW DELHI

STANDARD DRAWINGS FOR ROAD BRIDGES

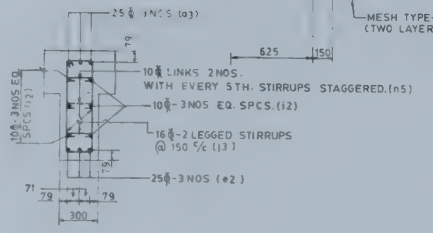
R C C T-BEAM AND SLAB SUPERSTRUCTURE
12·0M. SPAN WITH & WITHOUT FOOTPATHS
DETAILS OF LONGITUDINAL GIRDERS.

RECOMMENDED BY		APPROVED BY	1951
(A N DHODAPKAR) E E	(N K SINHA) S E	(M. K. MUKHERJEE) C E	DRG NO SD/ 264

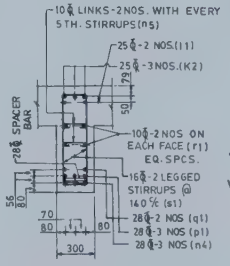
DRG.NO. SD/265.



LONGITUDINAL SECTION. OF END CROSS GIRDER


25 ϕ 3 NOS (a3)
10 ϕ LINKS 2 NOS. WITH EVERY 5TH. STIRRUPS STAGGERED.(n5)
10 ϕ-3 NOS EQ. SPCS.(i2)
16 ϕ-2 LEGGED STIRRUPS @ 150 c/c (j3)
25 ϕ-3 NOS (e2)
10A-3 NOS EQ. SPCS (i2)
300

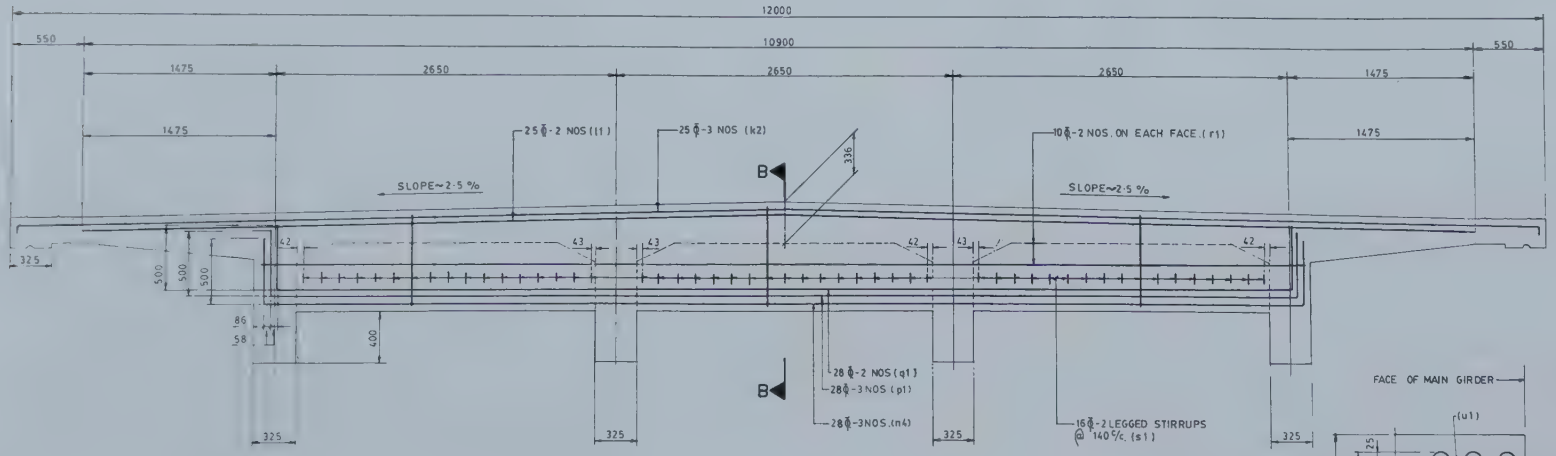
SECTION-A-A.


10 ϕ LINKS-2 NOS. WITH EVERY 5TH. STIRRUPS(n5)
25 ϕ-2 NOS.(i1)
25 ϕ-3 NOS.(k2)
28 ϕ SPACER BAR
10 ϕ-2 NOS ON EACH FACE (r1) EQ. SPCS.
16 ϕ-2 LEGGED STIRRUPS @ 140 c/c (s1)
28 ϕ-2 NOS (q1)
28 ϕ-3 NOS (p1)
28 ϕ-3 NOS (n4)
300

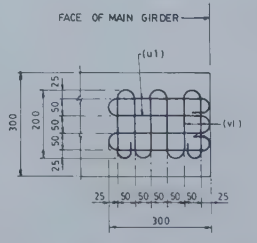
SECTION-B-B.

NOTES :-

1. The location of jacks for lifting of the superstructure to replace bearings etc. is shown thus ⬆ This shall be distinctly etched for easy identification on the end cross girder and pier/abutment caps.
2. During the lifting operation, all the six jacks placed under the end cross-girder in line with the bearings shall be operated simultaneously using single operating console, grouping the pump and control system, so as to ensure that the reactions on all the six jacks are equal at all times.
3. Capacity of each jack shall not be less than 20 Tons
4. This drawing shall be read in conjunction with the following drawings.
   i) General notes...Drg. No. SD/200.
   ii) Details of rocker and roller bearings..Drg. No. SD/204.
   iii) General arrangement. (for bridges without footpaths) Drg. No. SD/260.
   iv) General arrangement. (for bridges with footpaths.).. Drg. No. SD/261.
   v) Details of deck slab. (for bridges without footpaths.)... Drg. No. SD/262.
   vi) Details of deck slab. (for bridges with footpaths.)... Drg. No. SD/263.
   vii) Details of longitudinal girders...Drg. No. SD/264
   viii) Schedule of reinforcement. (for bridges without footpaths.)...Drg. No. SD/266, Sh-1 & Sh-2.
   ix) Schedule of reinforcement. (for bridges with foot paths)... Drg. No. SD/267, Sh-1 & Sh-2.



LONGITUDINAL SECTION. OF INTERMEDIATE CROSS GIRDER



8 ϕ MESH REINFORCEMENT TYPE - B

MKD	DATE	DESCRIPTION	BY
		REVISION	

GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
(ROADS WING), NEW DELHI.

STANDARD DRAWINGS FOR ROAD BRIDGES

R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE 12·0 M SPAN WITH AND WITHOUT FOOTPATHS DETAILS OF CROSS GIRDERS.

RECOMMENDED BY		APPROVED BY	1991
(A.N. DHODAPKAR) E.E.	(N.K. SINHA). S.E	(M.K. MUKHERJEE) C.E	DRG. NO SD/265.

DRG.NO.SD/266 Sh1

SCHEDULE OE REINFORCEMENT (PER SPAN)

A) H.Y.S.D. BARS.

Sl. No.	Type of bars.	Shape of bars.(not to scale) (dimensions are in millimetres)	Dia of bars (m.m)	Length of each bar. (m.m)	No.of bars	Total length (m)	Weight (kg.)
		Slab					
1	a	8575	12	8575	104	891·80	802·62
2	b	150, R=120, 749, 530, 1692, 500, 140, R=120, 137	12	2976	68	202·37	182·13
3	c	150, 150, L, L, 12460, L= Varying from 109 to 212.	10	12960	37	479·52	287·71
4	d	140, 1502, 7760, R=100, 140, 1502, L, L, 850, 850, Varying from R=100 0 to 70, L= Varying from 68 to 270.	10	12962	16	207·39	124·43
5	e	150, Varying from 249(min), R=120, Varying from 530 to 400, Varying from 1543 to 1692, 500, 140, Varying from 137 to 198.	12	2987	44	131·43	118·28
6	f	5952, 5952, 75, R=120, 75, 149	12	12054	54	650·92	585·82
7	g	3826, 120, 196	20	3946	104	410·38	1025·96
8	h	3976, 3976, R=120, 99	12	7952	52	413·50	372·15
9	i	12460, L, L, 150, 150, L= Varying from 109 to 212	10	12960	37	479·52	287·71
10	j	12460, L, L, 75, 75, L=Varying from 68 to 270.	10	12888	16	206·21	123·72
11	k	2230, L, L, 170, L=Varying from 109 to 212.	12	2488	72	179·14	161·22
12	l	4000	12	4000	36	144·00	129·60
13	m	11900	12	11900	4	47·60	42·84
14	n	12460	10	12460	4	49·84	29·90
15	n1	12460	16	12460	8	99·68	159·49
16	p	405, 380, 380, 438, 500, Varying from 37 to 54	10	2208	168	370·94	222·56
17	q	150, R=80, 150, 393, 860, 950, R=80, 443	8	2110	116	244·76	97·90
		Longitudinal girder.					
1	a_1	L_1=Varying from 1029 to 1033, L_2= Varying from 1037 to 1041, Varying from 193 to 493	16	3075	76	233·70	373·92
2	a_2	193, 1033, 1037, 193	16	2776	32	88·83	142·13
3	b_1	193, 1033, 1037, 193	12	2696	92	248·03	223·23
4	c_1	708, R=96, Elevation, 166, 836, 1508, 500, Plan	16	3488	16	55·81	89·30
5	d_1	12432, 708, R=96, 708	16	13720	8	109·76	175·62
6	e_1	7760	10	7760	24	186·24	111·74
7	f_1	1508, 650, 160, 836	10	2994	64	191·62	114·97

Sl. No.	Type of bars.	Shape of bars (not to scale) (dimensions are in millimetres)	Dia of bars. (m.m)	Length of each bar. (m.m.)	No. of bars.	Total length (m.)	Weight (kg.)
8	g_1	716, R = 192, 716, 12432	32	13608	12	163·30	1028·76
9	g_2	716, R = 192, 716, 12304	32	13480	12	161·76	1019·09
10	g_3	716, R = 192, 716, 12176	32	13352	12	160·22	1009·41
11	g_4	766, R = 192, 766, 12048	32	13324	6	79·94	503·65
12	g_5	2080, 6800, 2080, 162	32	10960	4	43·84	276·19
13	h_1	250, 1830, R = 640, 8400, 1830, 250	32	12560	4	50·24	316·51
14	j_1	L_1= Varying from 1095 to 1099, L_1 L_2, L_2= Varying from 1103 to 1107., Varying from 193 to 493	16	3208	84	269·47	431·15
15	j_2	193, 1099, 1103, 193	16	2908	76	221·01	353·62
16	k_1	193, 1099, 1103, 193	12	2828	32	90·50	81·45
17	m_1	836, 1508, 1500, 493, 836, 1508, 1500	32	7925	8	63·40	399·42
18	n_2	L, 140, 140, L=Varying from 225 to 525	10	595	56	33·32	19·99
19	n_3	225, 140, 140	10	445	102	45·39	27·23

B) M.S. BARS (MESH REINFORCEMENT IN LONGITUDINAL GIRDERS)

1	u	25, 375, 30, 30, 375, 375, 25, 75, 75, 75, 75, 75, 75	8	3550	16	56·80	22·72
2	v	75, 75, 75, 75, 30, 25, 30, 37·5, 450, 25	8	3506	16	56·10	22·44

NOTES:

1. Dimensions in the schedule are given as per IS: 2502 -1963.
2. The exact length of the bars will be determined by the actual laps with splices adopted at site.
3. This drawing shall be read in conjunction with following drawings
   - i) General notes ··· Drg. No.- SD/200.
   - ii) Details of deck slab (for bridges without footpaths) Drg. No.-SD/262.
   - iii) Details of longitudinal girders ··· Drg. No.-SD/264.

MKD	DATE	DESCRIPTION	BY
		REVISION	

GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
(ROADS WING), NEW DELHI

STANDARD DRAWINGS FOR ROAD BRIDGES

R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE
12·0 M. SPAN WITHOUT FOOTPATHS.
SCHEDULE OF REINFORCEMENT.

RECOMMENDED BY		APPROVED BY	1991
(A.N. DHODAPKAR) E E	(N K SINHA) S.E	(M.K. MUKHERJEE) C E	DRG NO. SD/266 Sh-1.

DRG NO.-SD/266 Sh-2

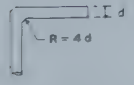
SCHEDULE OF REINFORCEMENT (PER SPAN)

A) H.Y.S.D BARS

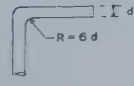
Sl No.	Type of bars	Shape of bars (not to scale) (dimensions are in millimetres)	Dia of bars (m.m.)	Length of each bar (m.m.)	No. of bars	Total length (m.)	Weight (kg.)
		CROSS GIRDER					
1	a_3	95, 5952, 5952, 95, 161	25	12094	6	72·56	275·73
2	e_2	513, R=150, 513, 8420	25	9296	6	55·78	211·96
3	i_2	8443	10	8443	6	50·66	30·39
4	j_3	B, 168, B=Varying from 643 TO 734	16	2033	84	170·77	273·23
5	k_2	95, 5952, 5952, 95, 161	25	12094	3	36·28	137·86
6	l_1	5452, 5452, 111	25	10904	2	21·81	82·87
7	n_4	514, R=168, 514, 8131	28	8935	3	26·80	128·65
8	p_1	514, R=168, 514, 8015	28	8819	3	26·46	126·99
9	q_1	514, R=168, 514, 7899	28	8703	2	17·41	83·55
10	r_1	8151	10	8151	4	32·60	19·56
11	s_1	B, 168, B= Varying from 643 TO 734	16	2033	51	103·68	165·89
12	n_5	140, 200, 140	10	420	54	22·68	13·61
		B) M.S. BARS (MESH REINFORCEMENT IN CROSS GIRDERS)					
13	u_1	30, 30, 50, 50, 50, 25, 250, 25	8	1453	24	34·87	13·95
14	v_1	30, 30, 25, 150, 25, 50, 50, 50, 50, 50	8	1510	24	36·24	14·50

MAXIMUM DEAD LOAD REACTIONS (in KN)

At Abutment	At Pier
1000	2000



d = Dia of bar
For bar upto 25 mm dia



d = Dia of bar
For bar above 25 mm dia

TOTAL QUANTITY* (PER SPAN)

1. STEEL ··· H.Y.S.D. BARS ··· ···13·65T
   ··· M.S. BARS ··· ··· ···0·08T
   (including 5% extra for laps and wastage)
2. CONCRETE ··· ··· ··· ··· 68·70 m^3

* Excluding quantities for railings.

NOTES

1. Dimensions in the schedule are given as per IS: 2502 - 1963.
2. The exact length of the bars will be determined by the actual laps /splices adopted at site.
3. This drawing shall be read in conjunction with following drawings
   i) General notes ··· Drg. No.-SD/200.
   ii) Details of cross girders ··· Drg. No.-SD/265.
   iii) Schedule of reinforcement ··· Drg. No.-SD/266 Sh-1.

MKD.	DATE	DESCRIPTION	BY.
		REVISION	

GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
(ROADS WING), NEW DELHI

STANDARD DRAWINGS FOR ROAD BRIDGES.

R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE
12·0M. SPAN WITHOUT FOOTPATH.
SCHEDULE OF REINFORCEMENT.

RECOMMENDED BY		APPROVED BY.	1991
(A.N. DHODAPKAR) E.E.	(N.K SINHA). S E	(M.K. MUKHERJEE) C E	DRG. NO. SD/266 Sh-2

DRG NO-SD/267 Sh-1

SCHEDULE OF REINFORCEMENT (PER SPAN)

A) H.Y.S.D. BARS

Sl No	Type of bars.	Shape of bars (not to scale.) (dimensions are in millimetres.)	Dia of bars. (mm)	Length of each bar. (mm)	No. of bars.	Total length (m)	Weight (kg.)
		Slab / Footpath					
	a	8575	12	8575	104	891 80	802 62
	b	150, R=120, 530, 1692, 500, R=120, 249, 140, 137	12	2976	68	202·37	182·13
	c	150, 150, L, L, 12460, L= Varying from 109 to 212	10	12960	37	479·52	287·71
	d	140, 1502, 7760, R=100, 140, 1502, 850, 850, Varying from R=100. 0 to 70, L=Varying from 68 to 270.	10	12962	16	207·39	124·43
	e	150, Varying from 249 to 313, Varying from 530 to 700, R=120, Varying from 1543 to 1692, 500, 140, Varying from 137 to 198	12	2987	44	131·43	118·28
	f	5952, 5952, 75, R=120, 75, 149	12	12054	54	650·92	585·82
	g	3826, 120, 196	20	3946	104	410 38	1025·96
	h	3976, 3976, R=120, 99	12	7952	52	413·50	372·15
		12460, L, L, 150, 150, L=Varying from 109 to 212.	10	12960	37	479·52	287·71
		12460, L, L, 75, 75, L=Varying from 68 to 270.	10	12888	16	206·21	123·72
	k	2230, L, 170, L=Varying from 109 to 212	12	2488	72	179·14	161 22
		4000	12	4000	36	144·00	129·60
	m	11900	12	11900	4	47·60	42 84
	n	12460	10	12460	20	249·20	149·52
	n_1	12460	16	12460	8	99 68	159·49
	p	405, 530, 530, 438, 500, Varying from 37 to 54	10	2503	168	420 50	252·30
	q	150, 150, R=80, R=80, 393, 860, 950, 443	8	2110	116	244 76	97·90
	r	80, 530, 530, 500, 500	10	1860	126	234 36	140·62
19	s	12460	10	12460	16	199·36	119·62
20	t	1400	10	1400	126	176·40	105·84
		Longitudinal girder.					
1	a_1	L_1=Varying from 1029 to 1033, L_2 Varying from 1037 to 1041, Varying from 193 to 493	16	3075	76	233·70	373·92
2	a_2	193, 1033, 1037, 193	16	2776	32	88·83	142·13
3	b_1	193, 1033, 1037, 193	12	2696	92	248·03	223·23

Sl. No.	Type of bars.	Shape of bars.(not to scale) (dimensions are in millimetres.)	Dia of bars. (mm)	Length of each bar. (m.m.)	No. of bars.	Total length (m.)	Weight (kg)
4	c_1	708, R=96, Elevation, 166, 836, 1508, 500, Plan	16	3488	16	55·81	89·30
5	d_1	12432, 708, R = 96, 708	16	13720	8	109·76	175 62
6	e_1	7760	10	7760	24	186·24	111·74
7	f_1	1508, 650, 160, 836	10	2994	64	191·62	114·97
8	g_1	716, R = 192, 716, 12432	32	13608	12	163 30	1028 76
9	g_2	716, R = 192, 716, 12304	32	13480	12	161·76	1019 09
10	g_3	716, R = 192, 716, 12176	32	13352	12	160·22	1009·41
11	g_4	766, R = 192, 766, 12048	32	13324	6	79·94	503·65
12	g_5	2080, 2080, 162, 6800	32	10960	4	43·84	276·19
13	h_1	162, 250, 1830, R = 640, 1830, 250, 162, 8400	32	12560	4	50·24	316 51
14	j_1	L_1= Varying from 1095 to 1099, L_1 L_2, L_2= Varying from 1103 to 1107. Varying from 193 to 493	16	3208	84	269·47	431·15
15	j_2	193, 1099, 1103, 193	16	2908	76	221·01	353·62
16	k_1	193, 1099, 1103, 193	12	2828	32	90·50	81·45
17	m_1	836, 1508, 1500, 493, 836, 1508, 1500	32	7925	8	63·40	399·42
18	n_2	L, 140, 140, L= Varying from 225 to 525	10	595	56	33·62	19·99
19	n_3	225, 140, 140	10	445	102	45·39	27·23

B) M.S. BARS (MESH REINFORCEMENT IN LONGITUDINAL GIRDERS)

1	u	25, 375, 375, 30, 30, 375, 375, 25, 75, 75, 75, 75, 75, 75	8	3550	16	56·80	22·72
2	v	30, 25, 75, 75, 75, 75, 75, 75, 30, 375, 450, 25	8	3506	16	56·10	22·44

NOTES

1. Dimensions in the schedule are given as per IS:2502-1963.
2. The exact length of the bars will be determined by the actual laps / splices adopted at site
3. This drawing shall be read in conjunction with following drawings
   - i) General notes ··· Drg. No.-SD/200.
   - ii) Details of deck slab (for bridges with footpath) ··· Drg. No.-SD/263.
   - iii) Details of longitudinal girders ··· Drg. No.-SD/264.

MKD	DATE	DESCRIPTION	BY
		REVISION	

GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
(ROADS WING), NEW DELHI

STANDARD DRAWINGS FOR ROAD BRIDGES

R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE
12·0 M. SPAN WITH FOOTPATH
SCHEDULE OF REINFORCEMENT

RECOMMENDED BY		APPROVED BY	1991
(A.N. DHODAPKAR) E.E.	(N.K SINHA) S.E.	(M.K. MUKHERJEE) C.E.	DRG NO SD/267-Sh-1.

SCHEDULE OF REINFORCEMENT (PER SPAN)

A) H.Y.S.D. BARS

Sl. No.	Type of bars	Shape of bars (not to scale) (dimensions are in millimetres)	Dia of bars (mm)	Length of each bar (mm)	No of bars	Total length (m)	Weight (kg)
		CROSS GIRDER					
1	a_3	5952, 5952, 95, 95, 161	25	12094	6	72·56	275·73
2	e_2	R=100, 513, 513, 8420	25	9296	6	55·78	211.96
3	i_2	8443	10	8443	6	50·66	30·39
4	j_3	B, 168; B=Varying from 643 TO 734	16	2033	84	170·77	273·23
5	k_2	5952, 5952, 95, 161	25	12094	3	36·28	137·86
6	l_1	5452, 5452, 111	25	10904	2	21·81	82·87
7	n_4	R=168, 514, 514, 8131	28	8935	3	26·80	128 65
8	p_1	R=168, 514, 514, 8015	28	8819	3	26·46	126·99
9	q_1	R=168, 514, 514, 7899	28	8703	2	17·41	83·55
10	r_1	8151	10	8151	4	32·60	19·56
11	s_1	B, 168; B= Varying from 643 TO 734	16	2033	51	103·68	165·89
12	n_5	140, 200, 140	10	420	54	22·68	13·61
		B) M.S. BARS (MESH REINFORCEMENT IN CROSS GIRDERS)					
13	u_1	30, 30, 50, 50, 50, 25, 250, 25	8	1453	24	34·87	13·95
14	v_1	30, 30, 25, 150, 25, 50, 50, 50, 50, 50	8	1510	24	36·24	14·50

MAXIMUM DEAD LOAD REACTIONS (in KN)

At Abutment	At Pier
1160	2320

d = Dia of bar
For bar upto 25 mm dia

d = Dia of bar
For bar above 25 mm dia

TOTAL QUANTITY* (PER SPAN)

1. STEEL ... H.Y.S.D. BARS ... ... 14·19 T
   ... M.S. BARS ... ... 0·08 T
   (including 5% extra for laps and wastage)
2. CONCRETE ... ... 84·15 m^3

* Excluding quantities for railing

NOTES

1. Dimensions in the schedule are given as per IS: 2502 - 1963
2. The exact length of the bars will be determined by the actual laps /splices adopted at site.
3. This drawing shall be read in conjunction with following drawings
   i) General notes ... Drg. No.-SD/200.
   ii) Details of cross girders ... Drg. No.-SD/265.
   iii) Schedule of reinforcement ... Drg. No.-SD/267 Sh-1.

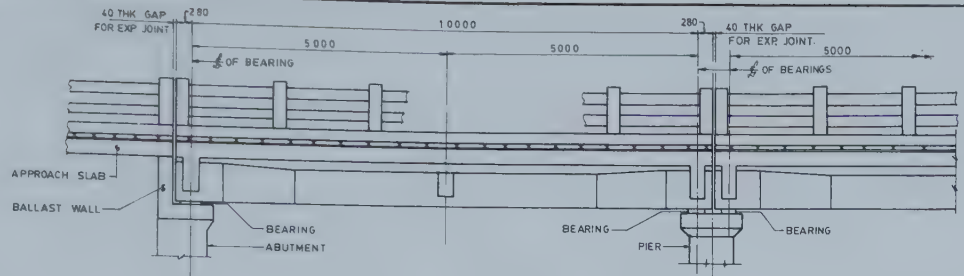
MKD	DATE	DESCRIPTION	BY
		REVISION	

GOVERNMENT OF INDIA.
MINISTRY OF SURFACE TRANSPORT.
(ROADS WING), NEW DELHI

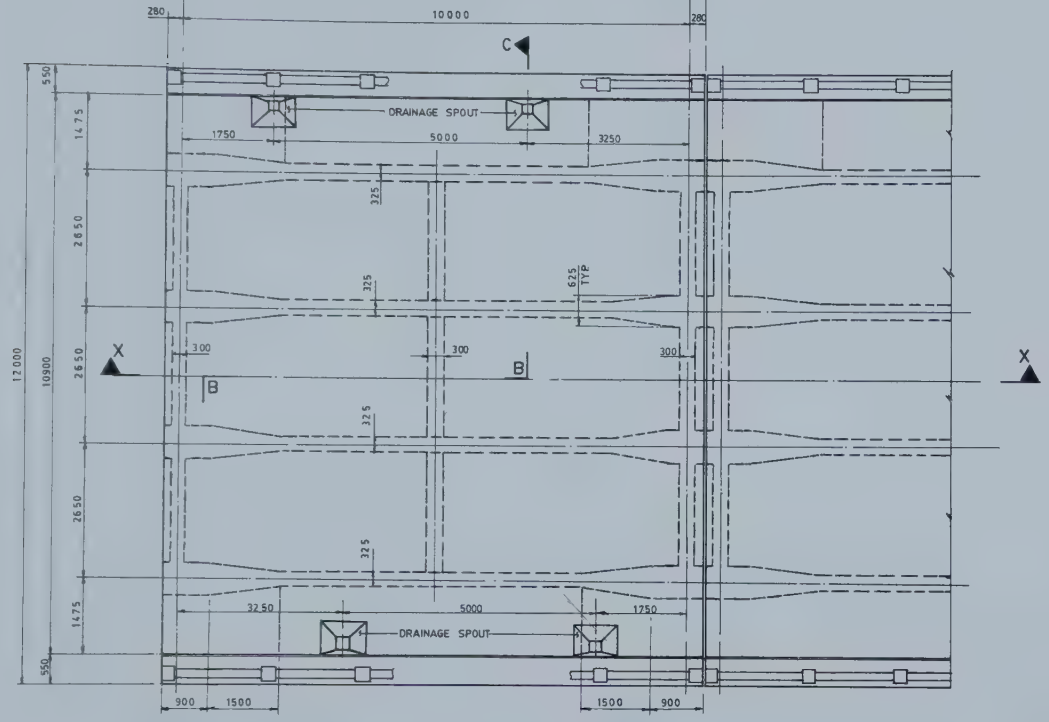
STANDARD DRAWINGS FOR ROAD BRIDGES

R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE
12·0M. SPAN WITH FOOTPATH
SCHEDULE OF REINFORCEMENT.

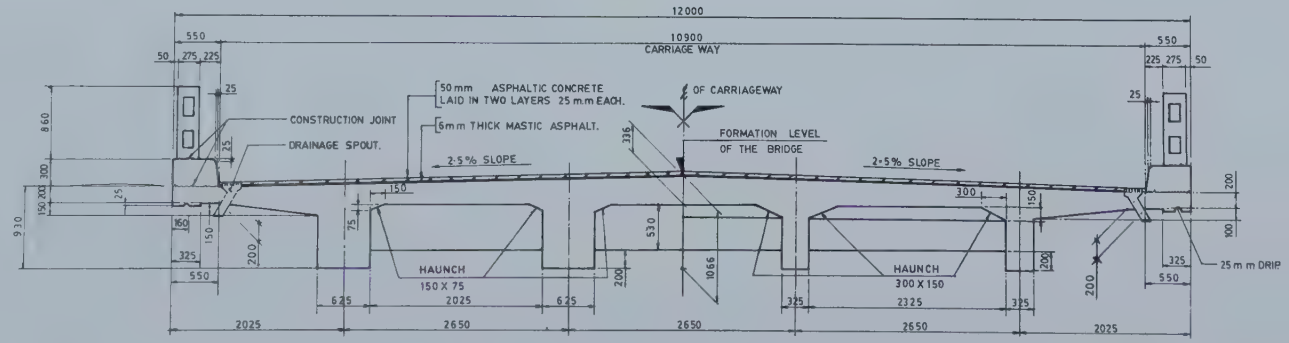
RECOMMENDED BY:		APPROVED BY.	1991
(A.N. DHODAPKAR) E.E.	(N.K. SINHA) S.E	(M.K. MUKHERJEE) C.E	DRG. NO. SD/267 Sh-2



SECTIONAL ELEVATION X X.



PLAN



SECTION A-B-C.

DRG. NO. SD/270.

NOTES

This drawing shall be read in conjunction with following drawings.

i) General notes....Drg. No. SD/200.
ii) Details of R.C.C. railing ....Drg. No. SD/201.
iii) Details of rocker and roller bearings...Drg.No. SD/204
iv) Details of miscellaneous items....Drg. No. SD/205.
v) Details of deck slab (for bridges without footpaths).... Drg. No. SD/272.
vi) Details of longitudinal girders....Drg. No. SD/274.
vii) Details of cross girders....Drg. No. SD/275.
viii) Schedule of reinforcement....Drg. No. SD/276.Sh-1 & Sh-2.

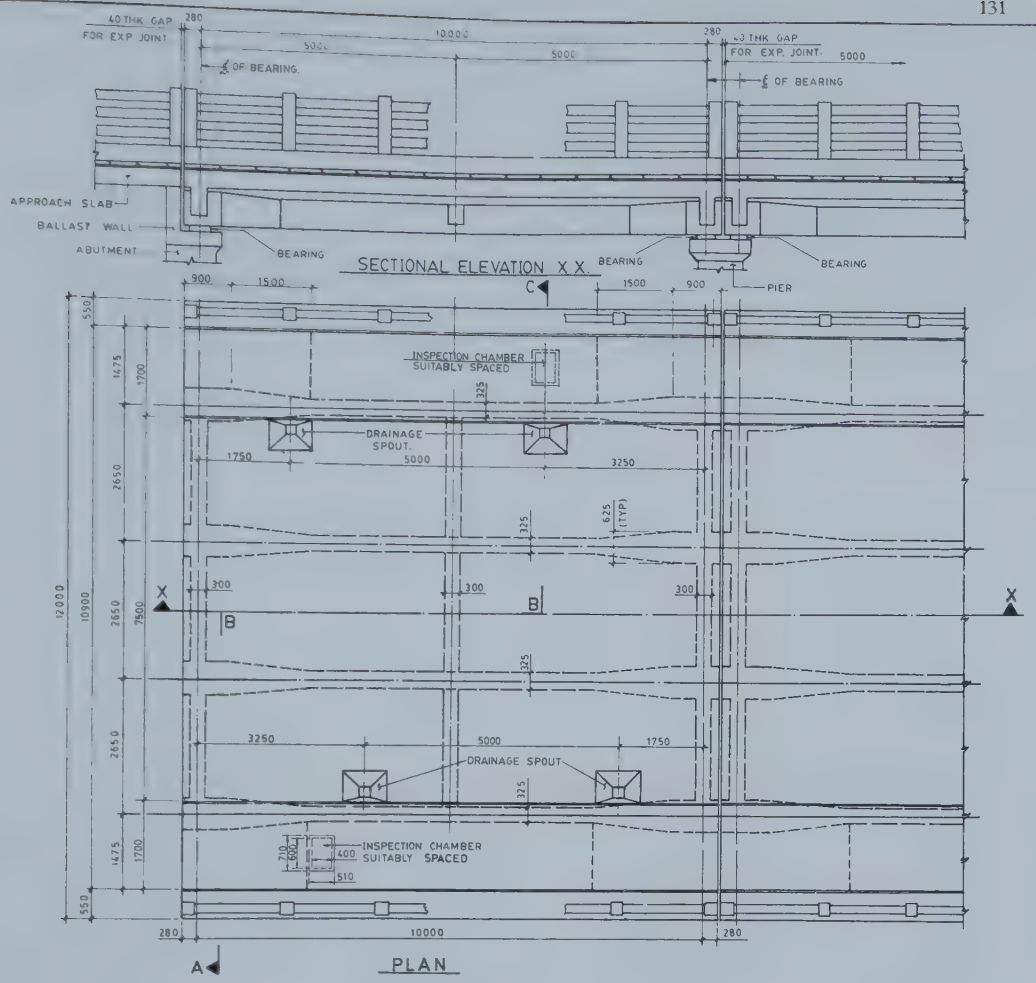
MKD.	DATE	DESCRIPTION	BY
		REVISION	

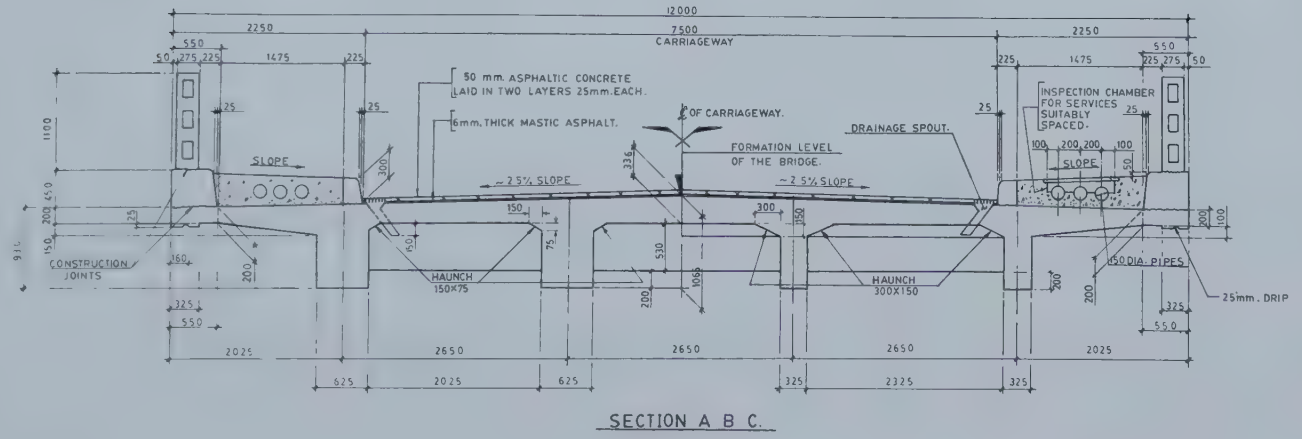
GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT.
(ROADS WING), NEW DELHI

STANDARD DRAWINGS FOR ROAD BRIDGES.

R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE
10·0 M SPAN WITHOUT FOOTPATHS.
GENERAL ARRANGEMENT

RECOMMENDED BY		APPROVED BY	1991
(A.N. DHODAPKAR). EE	(N.K. SINHA). S.E	(M.K. MUKHERJEE) C.E.	DRG. NO. SD/270





DRG. NO. SD/271

NOTES

This drawing shall be read in conjunction with following drawings.

i) General notes....Drg. No. SD/200.
ii) Details of R.C.C. railing ....Drg. No. SD/202.
iii) Details of rocker and roller bearings...Drg. No. SD/204
iv) Details of miscellaneous items.....Drg. No. SD/205.
v) Details of deck slab (for bridges with foot paths).... Drg. No. SD/273.
vi) Details of longitudinal girders....Drg. No. SD/274.
vii) Details of cross girders....Drg. No. SD/275.
viii) Schedule of reinforcement....Drg. No. SD/277 Sh.-1 & Sh.-2.

MKD	DATE	DESCRIPTION	BY

REVISION

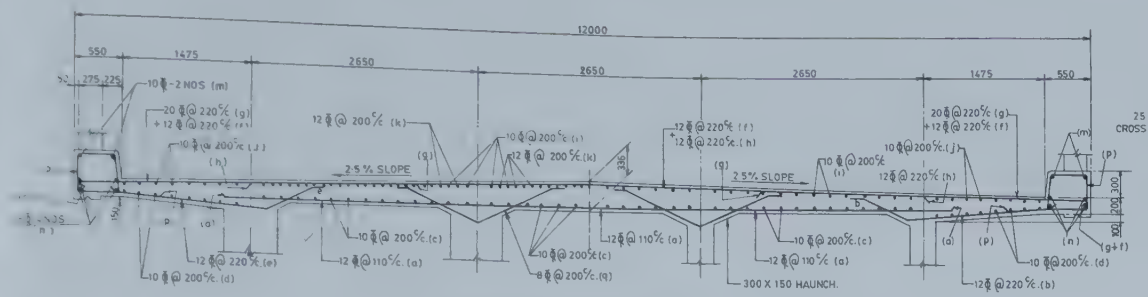
GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
(ROADS WING), NEW DELHI.

STANDARD DRAWINGS FOR ROAD BRIDGES.

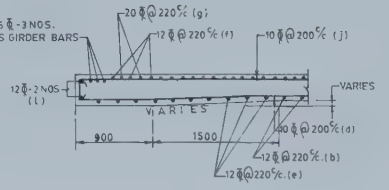
R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE 10·0 M. SPAN WITH FOOTPATHS GENERAL ARRANGEMENT.

RECOMMENDED BY		APPROVED BY	1991
(A.N. DHODAPKAR) E.E.	(N.K. SINHA) S.E.	(M.K. MUKHERJEE) C.E.	DRG. NO. SD/271

DRG. NO. SD/272.



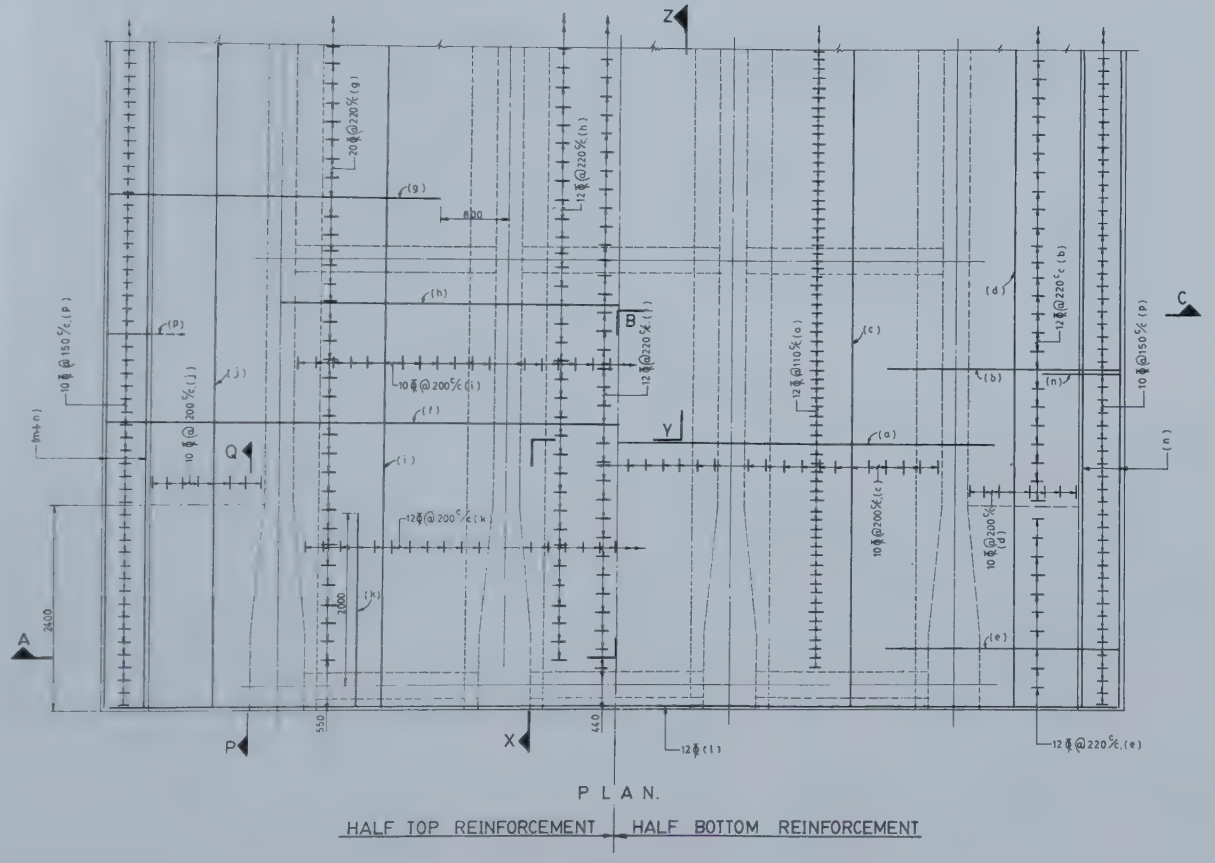
CROSS SECTION A B C.



SECTION P Q.

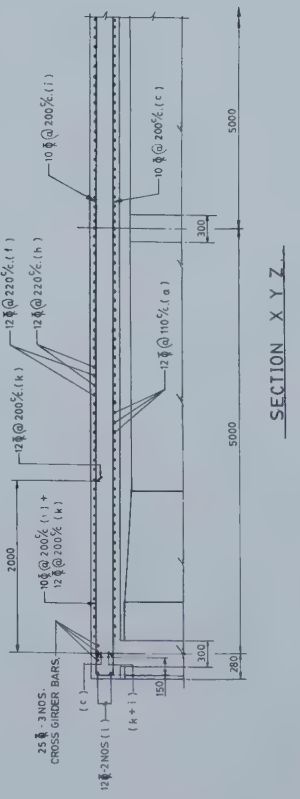
NOTES :-

1. The reinforcement for railing posts should be properly anchored in the deck slab before casting the slab.
2. This drawing shall be read in conjunction with following drawings.
   - i) General notes....Drg. No. SD/200.
   - ii) Details of R.C.C. railing....Drg. No. SD/201.
   - iii) Details of rocker and roller bearings....Drg. No. SD/204
   - iv) Details of miscellaneous items....Drg. No. SD/205.
   - v) General arrangement (for bridges without footpaths) ....Drg. No. SD/270.
   - vi) Details of longitudinal girders....Drg. No. SD/274.
   - vii) Details of cross girders....Drg. No. SD/275.
   - viii) Schedule of reinforcement....Drg. No. SD/276 Sh-1 & Sh-2.



PLAN.

HALF TOP REINFORCEMENT HALF BOTTOM REINFORCEMENT



SECTION X Y Z.

MKD	DATE	DESCRIPTION	BY
		REVISION.	

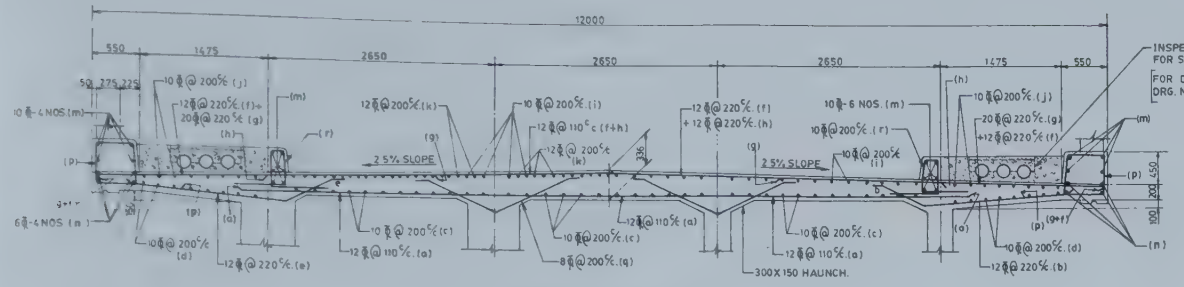
GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT.
(ROADS WING), NEW DELHI

STANDARD DRAWINGS FOR ROAD BRIDGES

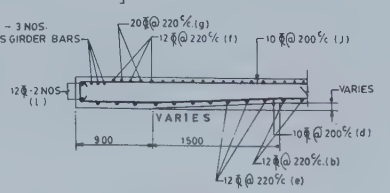
R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE 10·0 M SPAN WITHOUT FOOTPATHS DETAILS OF DECK SLAB.

RECOMMENDED BY:		APPROVED BY:	1991
(A.N. DHODAPKAR) E.E.	(N.K. SINHA). S.E.	(M.K. MUKHERJEE) C.E.	DRG. NO. SD/272.

DRG. NO. SD/273



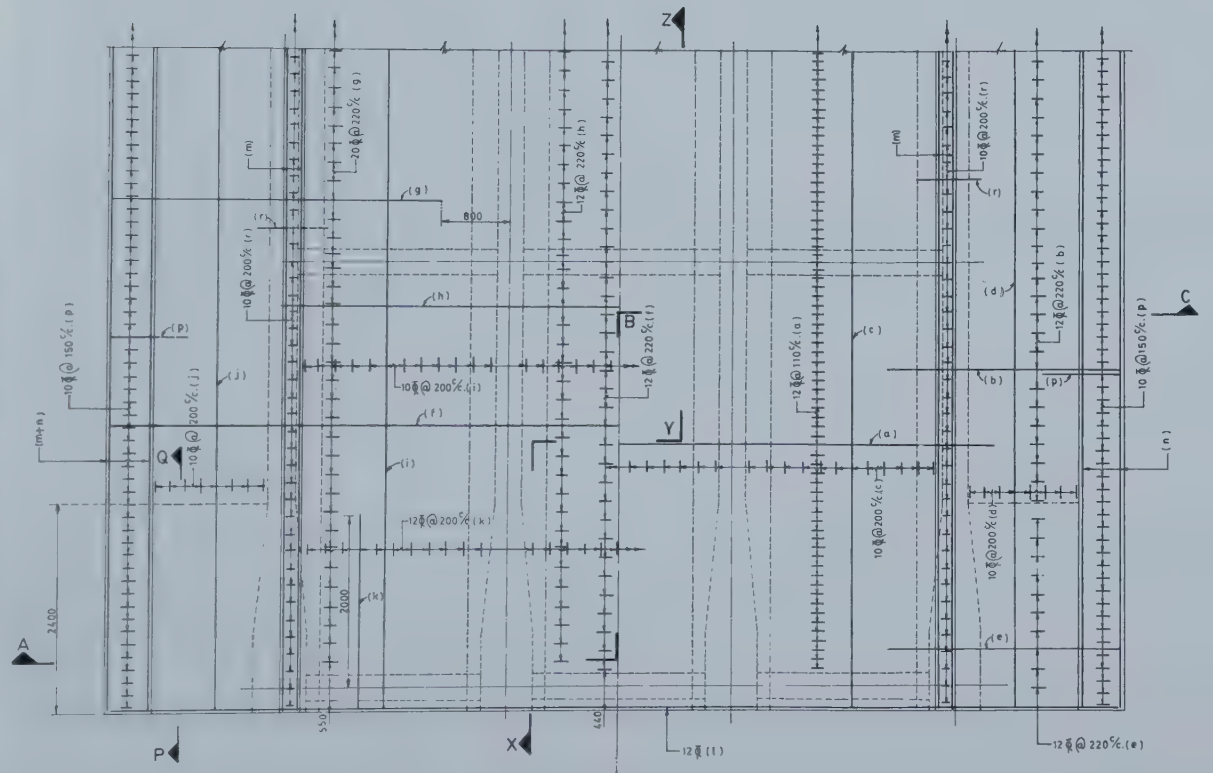
CROSS SECTION A B C.



SECTION P Q.

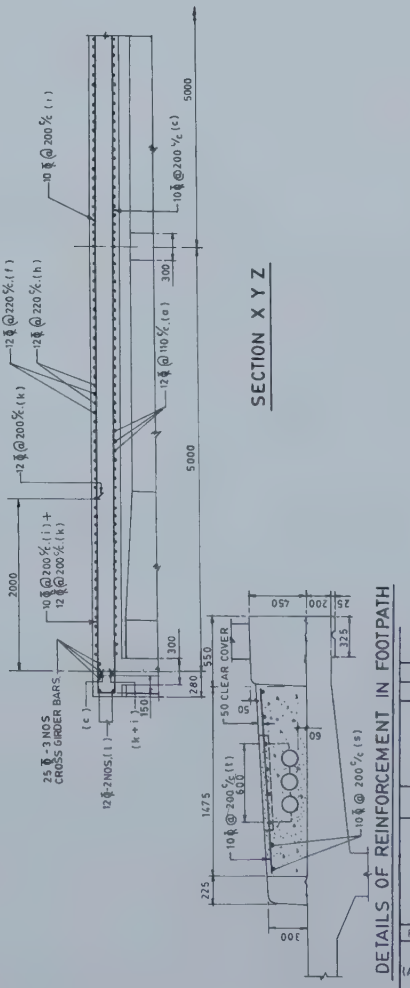
NOTES :-

1. The reinforcement for railing post should be properly anchored in the deck slab before casting the slab.
2. This drawing shall be read in conjunction with following drgs.
   - i) General notes....Drg. No. SD/200
   - ii) Details of R.C.C. railing....Drg. No. SD/202.
   - iii) Details of rocker and roller bearings....Drg. No. SD/204.
   - iv) Details of miscellaneous items....Drg. No. SD/205.
   - v) General arrangement. (for bridges with footpaths)....Drg. No. SD/271.
   - vi) Details of longitudinal girders....Drg. No. SD/274.
   - vii) Details of cross girders....Drg. No. SD/275.
   - viii) Schedule of reinforcement....Drg. No. SD/277. Sh-1 & Sh-2



P L A N.

HALF TOP REINFORCEMENT. HALF BOTTOM REINFORCEMENT.



SECTION X Y Z

DETAILS OF REINFORCEMENT IN FOOTPATH

MKD	DATE	DESCRIPTION	BY

REVISION

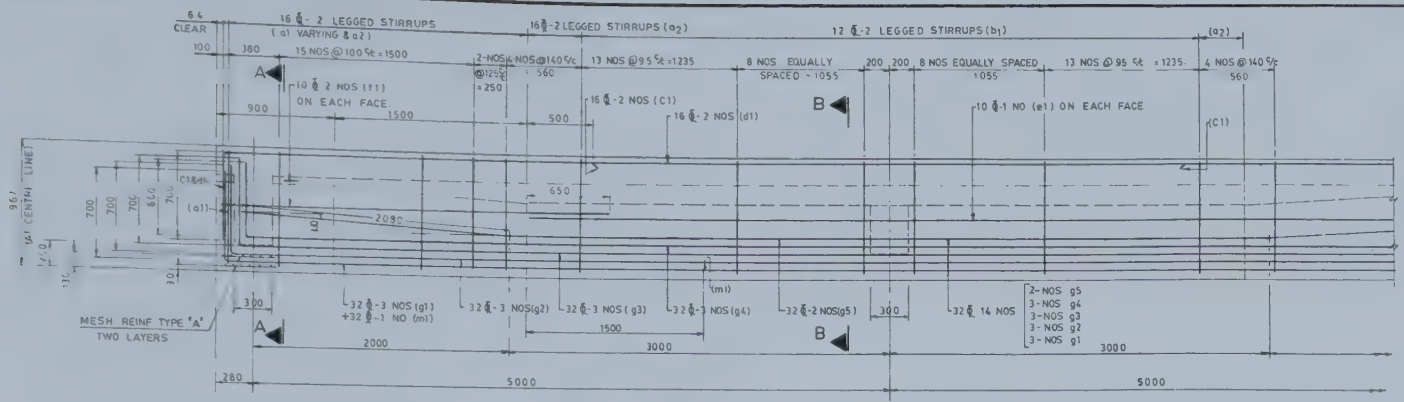
GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
(ROADS WING), NEW DELHI

STANDARD DRAWINGS FOR ROAD BRIDGES

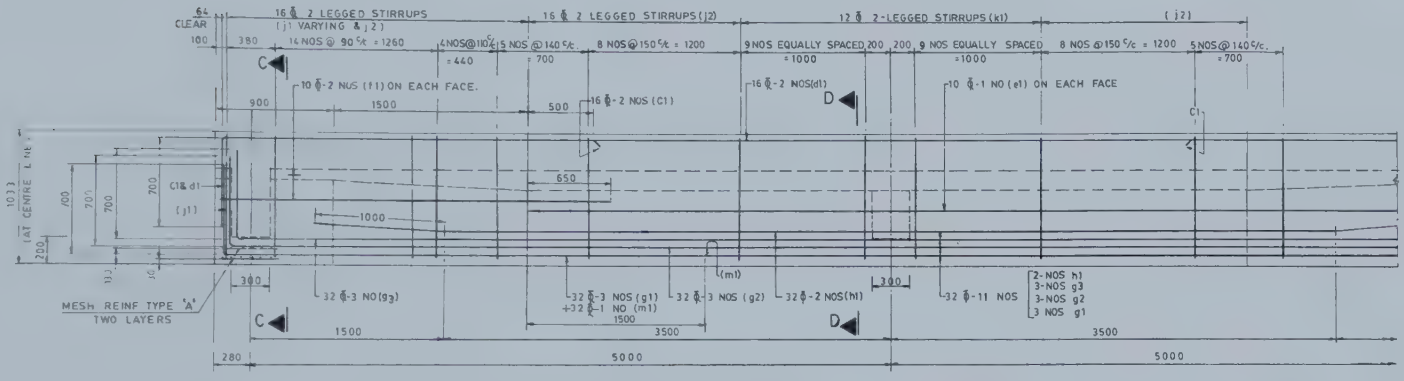
R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE
10·0 M SPAN WITH FOOTPATHS
DETAILS OF DECK SLAB.

RECOMMENDED BY		APPROVED BY	1991
(A.N. DHODAPKAR) E.E.	(N.K. SINHA) S.E.	(M.K. MUKHERJEE) C.E.	DRG. NO. SD/273.

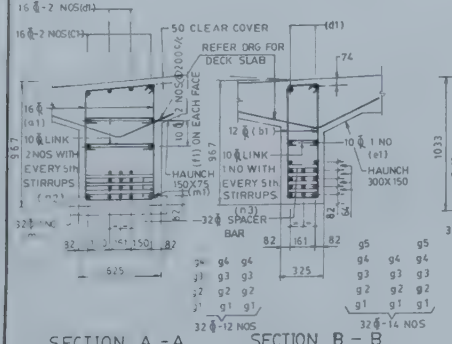
DRG. NO. SD/274


16 ϕ- 2 LEGGED STIRRUPS (a1 VARYING & a2)
16 ϕ-2 LEGGED STIRRUPS (a2)
12 ϕ-2 LEGGED STIRRUPS (b1)
15 NOS @ 100 c/c = 1500
13 NOS @ 95 c/c = 1235
8 NOS EQUALLY SPACED = 1055
4 NOS @ 140 c/c = 560
10 ϕ 2 NOS (f1) ON EACH FACE.
16 ϕ-2 NOS (C1)
16 ϕ-2 NOS (d1)
10 ϕ-1 NO (e1) ON EACH FACE
MESH REINF TYPE 'A' TWO LAYERS
32 ϕ-3 NOS (g1) +32 ϕ-1 NO (m1)
32 ϕ-3 NOS(g2)
32 ϕ-3 NOS (g3)
32 ϕ-3 NOS (g4)
32 ϕ-2 NOS(g5)
32 ϕ 14 NOS
2-NOS g5
3-NOS g4
3-NOS g3
3-NOS g2
3-NOS g1
5000

LONGITUDINAL SECTION OF OUTER GIRDER


16 ϕ 2 LEGGED STIRRUPS (j1 VARYING & j2)
16 ϕ 2 LEGGED STIRRUPS (j2)
12 ϕ 2-LEGGED STIRRUPS (k1)
14 NOS @ 90 c/c = 1260
15 NOS @ 140 c/c = 700
8 NOS @ 150 c/c = 1200
9 NOS EQUALLY SPACED = 1000
5 NOS @ 140 c/c = 700
10 ϕ-2 NOS (f1) ON EACH FACE.
16 ϕ-2 NOS (C1)
16 ϕ-2 NOS(d1)
10 ϕ-1 NO (e1) ON EACH FACE
MESH REINF TYPE 'A' TWO LAYERS
32 ϕ-3 NO(g3)
32 ϕ-3 NOS (g1) +32 ϕ-1 NO (m1)
32 ϕ-3 NOS (g2)
32 ϕ-2 NOS(h1)
32 ϕ-11 NOS
2-NOS h1
3-NOS g3
3-NOS g2
3 NOS g1
5000

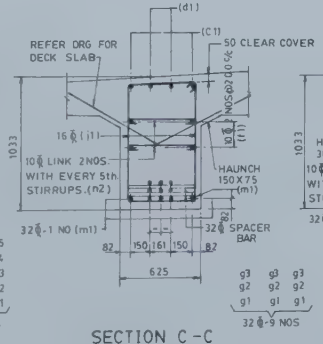
LONGITUDINAL SECTION OF INNER GIRDER


16 ϕ-2 NOS(d1)
16 ϕ-2 NOS(C1)
50 CLEAR COVER
REFER DRG FOR DECK SLAB
10 ϕ LINK 2 NOS WITH EVERY 5th STIRRUPS (n2)
10 ϕ LINK 1 NO WITH EVERY 5th STIRRUPS (n3)
10 ϕ 1 NO (e1)
HAUNCH 150X75 (m1)
HAUNCH 300X150
32 ϕ SPACER BAR
32 ϕ-12 NOS
32 ϕ-14 NOS

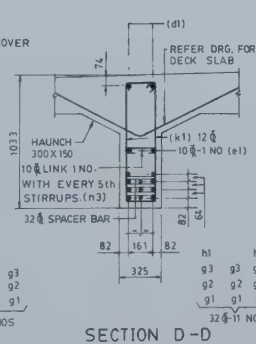
SECTION A - A

(g5 bars not shown)

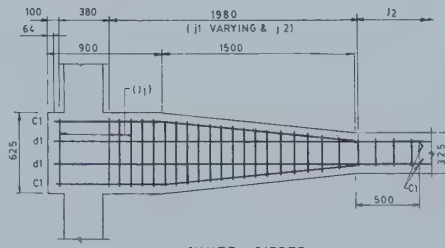
SECTION B - B


REFER DRG FOR DECK SLAB
50 CLEAR COVER
16 ϕ (j1)
10 ϕ LINK 2NOS WITH EVERY 5th STIRRUPS.(n2)
HAUNCH 150X75 (m1)
32 ϕ-1 NO (m1)
32 ϕ SPACER BAR
32 ϕ-9 NOS

SECTION C-C



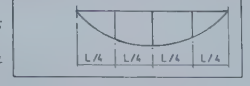
SECTION D-D



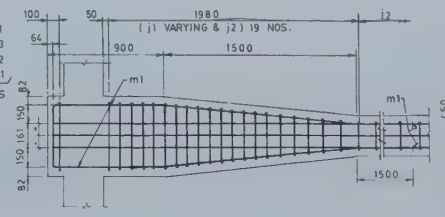
INNER GIRDER
PLAN SHOWING WEB REINF (TOP) AT THE END

TABLE - I

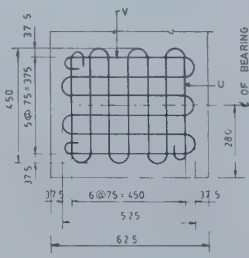
	1/4 POINT	MID SPAN	1/4 POINT
BRIDGE WITH F P	5 m m	7 m m	5 m m
BR WITH OUT F P	4 m m	6 m m	4 m m



DEAD LOAD
DEFLECTION DIAGRAM



(INNER GIRDER)
PLAN SHOWING WEB REINF. AT THE END
(SIMILAR SCHEME OF DETAILING WILL BE FOLLOWED FOR OUTER GIRDERS)



8 ϕ MESH REINFORCEMENT
TYPE - 'A'

NOTES

1. Longitudinal girders shall be given upward camber on account of dead load deflection as given in the table - I.
2. 32 ϕ spacer bars shall be provided @ 1 m c/c. between two tiers of longitudinal bars of girders.
3. This drawing shall be read in conjunction with the following drawings.

i) General notes...Drg. No. SD / 200.
ii) Details of rocker and roller bearings Drg. No. SD/204.
iii) General arrangement (for bridges without footpaths) Drg. No. SD / 270.
iv) General arrangement (for bridges with footpaths) Drg.No.SD/271
v) Details of deck slab (for bridges without footpaths) .. Drg. No. SD / 272.
vi) Details of deck slab (for bridges with footpath) Drg.No.SD/273.
vii) Details of cross girders,..Drg. No. SD/ 275.
viii) Schedule of reinforcement (for bridges without footpaths) Drg. No. SD/ 276. Sh-1 & Sh-2.
ix) Schedule of reinforcement (for bridges with footpaths) Drg. No. SD/ 277. Sh-1 & Sh-2.

MKD	DATE	DESCRIPTION	BY
		REVISION	

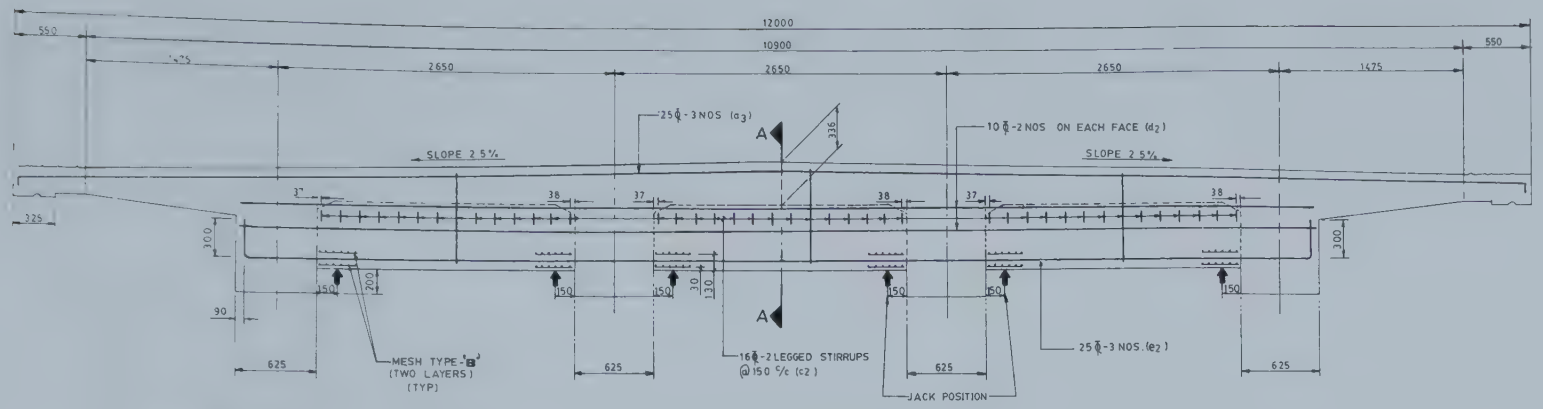
GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
(ROADS WING), NEW DELHI

STANDARD DRAWINGS FOR ROAD BRIDGES

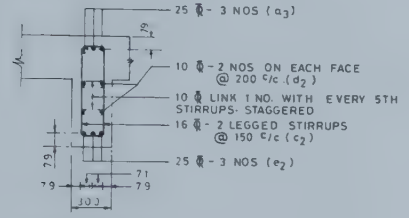
R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE
10·0 M. SPAN WITH & WITHOUT FOOTPATHS
DETAILS OF LONGITUDINAL GIRDERS

RECOMMENDED BY		APPROVED BY	1991
(A N DHODAPKAR). E E	(N.K. SINHA). S E	(M.K. MUKHERJEE) C E	DRG.NO. SD/ 274

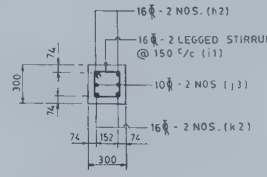
DRG.NO. SD/275.



LONGITUDINAL SECTION OF END CROSS GIRDER.


25φ - 3 NOS (a3)
10φ - 2 NOS ON EACH FACE @ 200 c/c (d2)
10φ LINK 1 NO. WITH EVERY 5TH STIRRUPS STAGGERED
16φ - 2 LEGGED STIRRUPS @ 150 c/c (c2)
25φ - 3 NOS (e2)
79
79
71
79
300

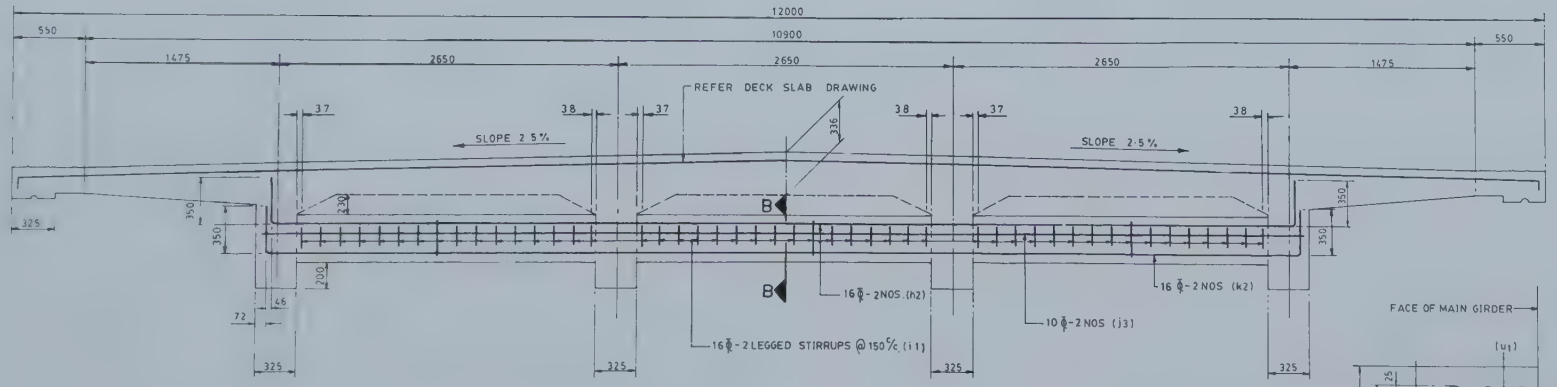
SECTION-A-A.



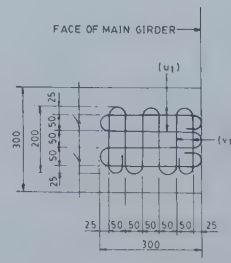
SECTION-B-B.

NOTES :-

1. The location of jacks for lifting of the superstructure to replace bearings etc. is shown thus ⬆. This shall be distinctly etched for easy identification on the end cross girders and pier/abutment caps.
2. During the lifting operation, all the six jacks placed under the end cross-girder in line with the bearings shall be operated simultaneously using single operating console, grouping the pump and control system, so as to ensure that the reactions on all the six jacks are equal at all times.
3. Capacity of each jack shall be not less than 16 Tons.
4. This drawing shall be read in conjunction with the following drawings.
   - i) General notes... Drg. No. SD/200.
   - ii) Details of rocker & roller bearings.. Drg. No. SD/204.
   - iii) General arrangement. (for bridges without footpaths).. Drg. No. SD/270.
   - iv) General arrangement. (for bridges with footpaths).. Drg. No. SD/271.
   - v) Details of deck slab. (for bridges without footpaths)... Drg. No. SD/272.
   - vi) Details of deck slab. (for bridges with footpaths)... Drg. No. SD/273.
   - vii) Details of longitudinal girders.. Drg. No. SD/274.
   - viii) Schedule of reinforcement (for bridges without footpaths).. Drg. No. SD/276, Sh-1 & Sh-2.
   - ix) Schedule of reinforcement (for bridges with footpaths) Drg. No. SD/277, Sh-1 & Sh-2.



LONGITUDINAL SECTION. OF INTERMEDIATE CROSS GIRDER



8φ MESH REINFS. TYPE-'B'

MKD	DATE	DESCRIPTION	Sr.
		REVISION	

GOVERNMENT OF INDIA.
MINISTRY OF SURFACE TRANSPORT
(ROADS WING) NEW DELHI

STANDARD DRAWINGS FOR ROAD BRIDGES

R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE. 10·0 M. SPAN WITH AND WITHOUT FOOTPATHS. DETAILS OF CROSS GIRDERS.

RECOMMENDED BY		APPROVED BY	1991
(A N DHODAPKAR) EE	(N K SINHA) SE	(M.K MUKHERJEE) C E	DRG NO SD/275.

DRG. NO. SD/276SH-1.

SCHEDULE OF REINFORCEMENT (PER SPAN)

A) H.Y.S.D. BARS

Sl No	Type of bars	Shape of bars (not to scale) (dimensions are in millimetres)	Dia of bars (mm)	Length of each bar (mm)	No of bars	Total length (m)	Weight (Kg)
		Slab					
1	a	8575	12	8575	89	763·175	686·86
2	b	150, 249, 530, R=120, 1692, 140, 500, 137, R=120	12	2976	54	160·70	144·63
3	c	L, 150, 150, L varying from 109 to 212, 10460	10	10960	39	427·44	256·46
4	d	L, 140, 901, 7360, R=1007, 140, 901, L, 650, R=100, varying from 0 to 70, 650, varying from 68 to 270	10	10960	16	175·36	105·22
5	e	varying from 150, 530 to 700, R 120, varying from 1543 to 1692, 140, 500, varying from 249 to 313, R=120, varying from 137 to 198	12	2987	40	119·48	107·53
6	f	75, 5952, R=120, 5952, 75, 149	12	12054	44	530·38	477·34
7	g	120, 3826, 96	20	3946	88	347·25	868·12
8	h	3976, R=120, 3976, 99	12	7952	44	349·89	314·90
9	i	10460, L, 150, 150, L = varying from 109 to 212	10	10960	39	427·44	256·46
10	j	10460, L, 75, 75, L, L = varying from 68 to 270	10	10888	16	174·21	104·53
11	k	2230, L, 170, L = varying from 109 to 212	12	2488	72	179·14	161·23
12	l	11900	12	11900	4	47·60	42·84
13	m	10460	10	10460	4	41·84	25·10
14	n	10460	16	10460	8	83·68	133·89
15	p	405, 380, 380, 443, 500, varying from 37 to 54	10	2208	140	309·12	185·47
16	q	393, 150, 860, R=80, 950, 150, R 80, 433	8	2110	96	202·56	81·02
		Longitudinal girders					
1	a_1	L1=varying from 837 to 841, L1, L2, L2=varying from 829 to 833, varying from 193 to 493	16	2676	80	214·08	342·53
2	a_2	833, 837, 193	16	2376	12	28·51	45·62
3	b_1	833, 837, 201	12	2312	84	194·21	174·79
4	c_1	708, R=96, 166, 836, 1508, 500, Elevation, Plan	16	3488	16	55·80	89·29
5	d_1	10432, 708, R=96, 708	16	11720	8	93·76	150·02
6	e_1	5760	10	5760	8	46·08	27·65
7	f_1	160, 836, 1508, 650	10	2994	32	95·81	57·48
8	g_1	716, R=192, 716, 10432	32	11608	12	139·30	877·59
9	g_2	716, R=192, 716, 10304	32	11480	12	137·76	867·89

Sl NO	Type of bars	Shape of bars (not to scale) (dimensions are in millimetres)	Dia of bars (mm)	Length of each bar (mm)	No of bars	Total length (m)	Weight (Kg)
10	g_3	716, R=192, 716, 10176	32	11352	12	136·22	858·19
11	g_4	616, R=192, 616, 10048	32	11024	6	66·14	416·71
12	g_5	2080, 6000, 2080, 162	32	10160	4	40·64	256·03
13	h_1	1000, 7000, 1000, 162	32	9000	4	36·00	226·80
14	j_1	L1=varying from 903 to 907, L1, L2, L2=varying from 895 to 899, varying from 193 to 493	16	2808	84	235·87	377·39
15	j_2	903, 193, 899	16	2508	48	120·38	192·61
16	k_1	903, 201, 899	12	2444	36	87·98	79·18
17	m_1	493, 836, 1508, 1500, 836, 1508, 1500	32	7925	8	63·40	399·42
18	n_2	140, L, 140, L=Varying from 213 to 513	10	583	60	34·98	20·98
19	n_3	140, 225, 140	10	445	38	16·91	10·15

B) M.S. BARS (MESH REINFORCEMENT IN LONGITUDINAL GIRDERS)

1	u	25, 375, 30, 30, 375, 375, 25, 75 75 75 75 75 75	8	3550	16	56·80	22·72
2	v	30, 30, 30, 75 75 75 75 75, 37·5, 450, 25	8	3506	16	56·10	22·44

NOTES:

1 Dimensions in the schedule are given as per IS: 2502-1963.
2 The exact length of the bars will be determined by the actual laps / splices adopted at site.
3 This drawing shall be read in conjunction with following drawings.
i) General notes... Drg No. SD/200.
ii) Details of deck slab (for bridges without footpath)... Drg No SD/272.
iii) Details of longitudinal girders... Drg. No. SD/274.

MKD	DATE	DESCRIPTION	BY
		REVISION	

GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
(ROADS WING), NEW DELHI

STANDARD DRAWINGS FOR ROAD BRIDGES

R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE
10·0 M SPAN WITHOUT FOOTPATHS
SCHEDULE OF REINFORCEMENT

RECOMMENDED BY		APPROVED BY	1981
(A.N DHODAPKAR) E.E	(N.K.SINHA) S.E.	(M.K. MUKHERJEE) C.E	DRG NO SD/276-SH-1.

DRG. NO. SD/276 SH-2

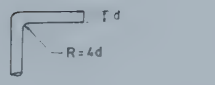
SCHEDULE OF REINFORCEMENT (PER SPAN)

A) H.Y.S.D. BARS

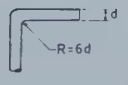
Sl No	Type of bars	Shape of bars (not to scale) (dimensions are in millimetre)	Dia of bars (mm)	Length of each bar (mm)	No of bars	Total length (m)	Weight (Kg)
		Cross Girders					
	a^3	5952, 120, R=250, 5952, 120, 152	25	12144	6	72·86	276·87
	c^2	168, Varying from 644 to 734	16	2034	84	170·86	273·37
	d^2	8420	10	8420	8	67·36	40·41
	e^2	R=100, 313, 8420, 313	25	8846	6	53·08	201·70
	h^2	R=64, 358, 8083, 358	16	8703	2	17·41	27·86
5	i^1	168, 168	16	992	48	47·62	76·19
7	j^3	8175	10	8175	2	16·35	9·81
8	k^2	R=64, 358, 8147, 358	16	8767	2	17·53	28·05
9	l^1	200, 140, 140	10	420	18	7·56	4·54

B) M.S. BARS (MESH REINFORCEMENT IN CROSS GIRDERS)

10	u	30 ϕ, 50, 50, 50, 25, 250, 25	8	1433	24	34·87	13·95
14	v^1	30 ϕ, 150, 25, 25, 50+50+50+50+50	8	1510	24	36·24	14·50



d = Dia of bar
For bar upto 25mm dia.



d = Dia of bar
For bar above 25mm dia.

MAXIMUM DEAD LOAD REACTIONS (IN KM)

At Abutment	At Pier
DL = 805	DL = 1610

TOTAL QUANTITY (PER SPAN)*

1. STEEL H.Y.S.D. BARS 10·88T
   M.S. BARS 0·08T
   (including 5% extra for laps and wastage)
2. CONCRETE 54·75 m^3

* Excluding quantities for railing.

NOTES

1. Dimensions in the schedule are given as per IS: 2502-1963.
2. The exact length of the bars will be determined by the actual laps / splices adopted at site.
3. This drawing shall be read in conjunction with following drawings.
   i) General notes...Drg. No. SD/200.
   ii) Details of cross girders...Drg. No. SD/275.
   iii) Schedule of reinforcement...Drg. No. SD/276 SH-1.

MKD	DATE	DESCRIPTION	BY
		REVISION	

GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
(ROADS WING), NEW DELHI

STANDARD DRAWINGS FOR ROAD BRIDGES.

R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE
10·0 M. SPAN WITHOUT FOOTPATHS.
SCHEDULE OF REINFORCEMENT

RECOMMENDED BY		APPROVED BY	1991
(A.N. DHODAPKAR) E.E.	(N.K. SINHA) S.E.	(M.K. MUKHERJEE) C.E.	DRG NO SD/276 SH-2.

DRG. NO. SD/277 Sh-1

A) H.Y.S.D. BARS.

SCHEDULE OF REINFORCEMENT (PER SPAN)

Sl. No	Type of bars	Shape of bars (not to scale) (dimensions are in millimetres)	Dia of bars (mm.)	Length of each bar (mm.)	No. of bars	Total length (m)	Weight (kg.)
		Slab / Footpath					
1	a	8575	12	8575	89	763·175	686·86
2	b	150, 530, R=120, 1692, 500, R=120, 140, 249, 137	12	2976	54	160·70	144·63
3	c	L, 150, 10460, 150, L = Varying from 109 to 212	10	10960	39	427·44	256·46
4	d	140, L, 901, 7360, R=100, 140, L = Varying from 68 to 270, Varying from 0 to 70, 650, R=100, 650	10	10960	16	175·36	105·22
5	e	Varying from 249 to 313, 150, Varying from 530 to 700, R=120, Varying from 1697 to 1543, R=120, 500, 140, Varying from 137 to 198	12	2987	40	119·48	107·53
6	f	5952, 5952, R=120, 75, 75, 149	12	12054	44	530·38	477·34
7	g	3826, 120, 196	20	3946	88	347·25	868·12
8	h	3976, 3976, R=120, 99	12	7952	44	349·89	314·90
9	i	10460, L, 150, 150, L, L = Varying from 109 to 212	10	10960	39	427·44	256·46
10	j	10460, L, 75, 75, L, L = Varying from 68 to 270	10	10888	16	174·21	104·53
11	k	2230, L, 170, L = Varying from 109 to 212	12	2488	72	179·14	161·23
12	l	11900	12	11900	4	47·60	42·84
13	m	10460	10	10460	20	209·20	125·52
14	n	10460	16	10460	8	83·68	133·89
15	p	405, 530, 530, 438, 500, Varying from 37 to 54	10	2503	140	350·42	210·25
16	q	150, R=80, 150, 393, 860, 950, R=80, 433	8	2110	96	202·56	81·02
17	r	80, 390, 390, 500, 500	10	1860	106	197·16	118·29
18	s	10460	10	10460	16	167·36	100·42
19	t	1400	10	1400	106	148·40	89·04
		Longitudinal girders					
1	a_1	L_1 = Varying from 837 to 841, L_2 = Varying from 829 to 833, Varying from 193 to 493	16	2676	80	214·08	342·53
2	a_2	833, 837, 193	16	2376	12	28·51	45·62
3	b_1	833, 837, 201	12	2312	84	194·21	174·79
4	c_1	708, R=96, 166, 836, 1508, 500 — Elevation, Plan	16	3488	16	55·80	89·29
5	d_1	10432, 708, R=96, 708	16	11720	8	93·76	150·02

Sl. No.	Type of bars	Shape of bars (not to scale) (dimensions are in millimitres)	Dia of bars (mm.)	Length of each bar (mm.)	No. of bars	Total length (m.)	Weight (kg.)
6	e_1	5760	10	5760	8	46·08	27·65
7	f_1	836, 1508, 650, 160	10	2994	32	95·81	57·48
8	g_1	716, R=197, 716, 10432	32	11608	12	139·30	877·59
9	g_2	716, R=192, 716, 10304	32	11480	12	137·76	867·89
10	g_3	716, R=192, 716, 10176	32	11352	12	136·22	858·19
11	g_4	616, R=192, 616, 10048	32	11024	6	66·14	416·71
12	g_5	2080, 2080, 162, 6000	32	10160	4	40·64	256·03
13	h_1	1000, 1000, 162, 7000	32	9000	4	36·00	226·80
14	j_1	L_1 = Varying from 903 to 907, L_2 = Varying from 895 to 899, Varying from 193 to 493	16	2808	84	235·87	377·39
15	j_2	193, 903, 899, 193	16	2508	48	120·38	192·61
16	k_1	201, 903, 899, 201	12	2444	36	87·98	79·18
17	m_1	836, 1508, 1500, 493, 836, 1508, 1500	32	7925	8	63·40	399·42
18	n_2	140, L, 140, L = Varying from 213 to 513	10	583	60	34·98	20·98
19	n_3	225, 140, 140	10	445	38	16·91	10·15

B) M.S. BARS (MESH REINFORCEMENT IN LONGITUDINAL GIRDERS)

1	u	25, 375, 375, 30, 30, 375, 375, 25, 75 75 75 75 75 75	8	3550	16	56·80	22·72
2	v	30, 30, 75 75 75 75 75, 37·5, 450, 25	8	3506	16	56·10	22·44

NOTES

1. Dimensions in the schedule are given as per IS: 2502-1963.
2. The exact length of the bars will be determined by the actule laps/splices adopted at site.
3. This drawing shall be read in conjunction with following drawings.
   - i) General notes ··· Drg. No.-SD/200.
   - ii) Details of deck slab (for bridges with footpaths) ··· Drg. No.-SD/273.
   - iii) Details of longitudinal girders ··· Drg. No.-SD/274.

MKD.	DATE	DESCRIPTION	BY.
		REVISION	

GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
(ROADS WING), NEW DELHI.

STANDARD DRAWINGS FOR ROAD BRIDGES

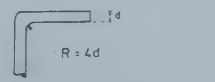
R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE 10·0 M SPAN WITH FOOTPATHS SCHEDULE OF REINFORCEMENT

RECOMMENDED BY		APPROVED BY	1991
(A.N. DHODAPKAR) E.E.	(N.K. SINHA) S.E.	(M.K. MUKHERJEE) C.E	DRG. NO. SD/277 SH 1.

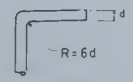
DRG. NO. SD/277 SH-2

A) H.Y.S.D. BARS — SCHEDULE OF REINFORCEMENT (PER SPAN)

Sl No	TYPE of bars	Shape of bars (not to scale) (dimensions are in milimetres)	Dia of bars (m.m)	Length of each bar (m.m)	No of bars	Total length (m)	Weight (kg)
		CROSS GIRDERS					
1	a_3	120, 5952, 5952, 1120, 152	25	12144	6	72·86	276·87
2	c_2	168, Varying from 644 to 734	16	2034	84	170·36	273·37
3	d_2	8420	10	8420	8	67·36	40·41
4	e_2	313, R=100, 313, 8420	25	8846	6	53·08	201·70
5	h_2	358, R=64, 358, 8083	16	8703	2	17·41	27·86
6	i_1	168, 168	16	992	48	47·62	76·19
7	j_3	8175	10	8175	2	16·35	9·81
8	k_2	358, R=64, 358, 8147	16	8767	2	17·53	28·05
9		140, 200, 140	10	420	18	7·56	4·54
		B) M.S. BARS (MESH REINFORCEMENT IN CROSS GIRDERS)					
10	u_1	30, 30, 50, 50, 50, 25, 250, 25	8	1453	24	34·87	13·95
11	v_1	30, 30, 25, 150, 25, 50, 50, 50, 50, 50	8	1510	24	36·24	14·50



d = Dia of bar
For bar upto 25 m.m. dia



d = Dia of bar
For bar above 25 m.m. dia

NOTES

1. Dimensions in the schedule are given as per IS:2502-1963.
2. The exact length of the bars will be determined by the actual laps/splices adopted at site.
3. This drawing shall be read in conjunction with following drawings.
   - i) General notes..Drg. No. SD 200
   - ii) Details of cross girders Drg. No. SD/275
   - iii) Schedule of reinforcement..Drg. No. SD/277 SH-1

MAXIUM DEADLOAD REACTIONS (IN K.M.)

At Abutment	At Pier
DL = 940·0	DL = 1880·0

TOTAL QUANTITY (PER SPAN)*

1 STEEL ... ... H.Y.S.D. BARS 11·33 T
... M.S. BARS 0·08 T
(including 5% extra for laps and wastage)

2 CONCRETE 67·75 m^3

*Excluding quantities for railing.

MKD	DATE	DESCRIPTION	BY
		REVISION	

GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
(ROADS WING), NEW DELHI

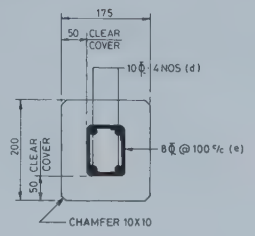
STANDARD DRAWINGS FOR ROAD BRIDGES

R C C T-BEAM AND SLAB SUPERSTRUCTURE
10·0 M SPAN WITH FOOTPATHS
SCHEDULE OF REINFORCEMENT

RECOMMEDED BY		APPROVED BY	1991
(A.N. DHODAPKAR), EE	(N.K. SINHA) SE	(M K MUKHERJEE) CE	DRG. NO. SD/277 SH-2

DRG. NO. SD/ 201.

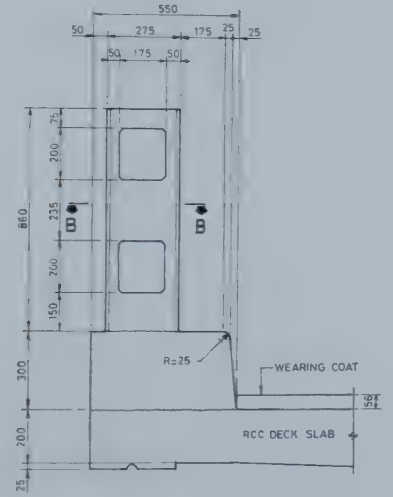
ELEVATION



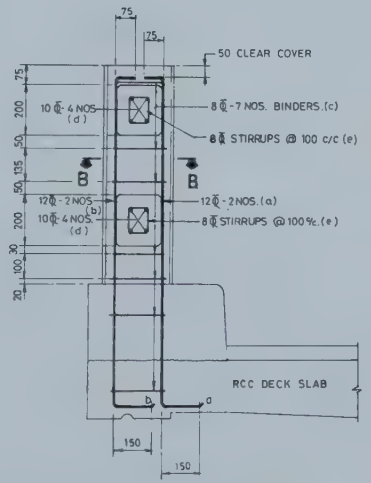
SECTION - A. A

NOTES

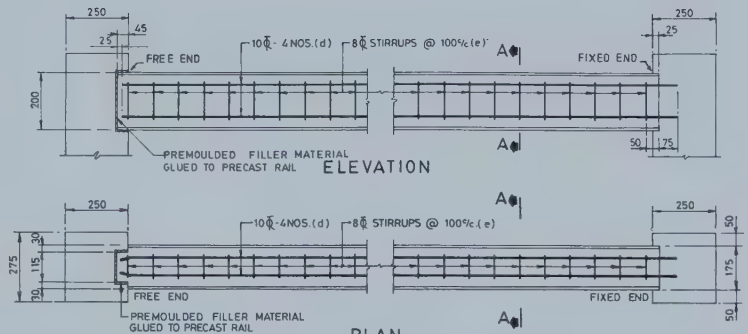
1. Centre to centre spacing between successive vertical posts shown in the elevation shall be adjusted to suit the length of bridge span for which the railing is used but in no case it shall exceed 1870 mm.
2. Reinforcement of railing post should be suitably anchored in deck slab.
3. Casting of post shall be done in single pour after accurately positioning the precast handrail.
4. Railing shall be constructed only after the structural concrete of superstructure has hardened and shuttering is released.
5. In case other type of railing is used the weight of same on each side shall not exceed 3 KN per metre.
6. Expansion gaps in railing shall be provided at the same locations as in the deck slab.
7. This drawing is to be read in conjunction with following drawing,
   i) General notes .... Drg. No. SD/ 200.



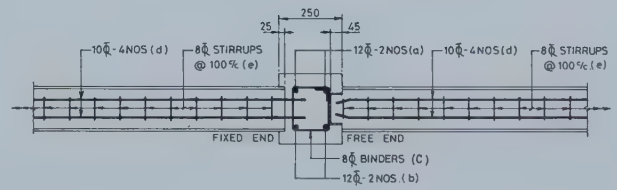
SECTION THROUGH POST
(DIMENSIONS ONLY)



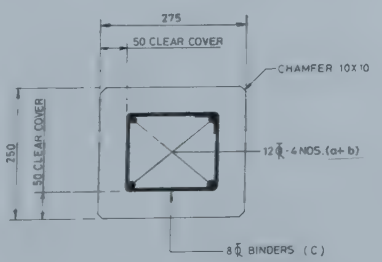
SECTION THROUGH POST



DETAIL OF PRECAST HANDRAIL



REINFORCEMENT ARRANGEMENT OF HANDRAIL & POST



SECTION-B.B

* = FOR END SPAN
** = FOR CENTRAL SPAN
S = END SPAN
C = CENTRAL SPAN

BAR BENDING SCHEDULE FOR HANDRAIL AND POST FOR DIFFERENT SPANS

SPAN A (m.)	SPACING OF POSTS (mm.)	NO OF POSTS	BAR MARK (a) 12ϕ - 2 NOS. PER POST				BAR MARK (b) 12ϕ - 2 NOS. PER POST				BAR MARK (c) 8ϕ BINDERS 7 NOS. PER POST				BAR MARK (d) 10ϕ - 4 NOS PER RAIL L = LENGTH OF BAR - 153 mm.				BAR MARK (e) 8ϕ STIRRUPS @100 c/c PER RAIL				TOTAL WEIGHT (KG) INCLUDING 5% FOR LAPS AND WASTAGE
			LENGTH OF BAR (mm)	NOS	TOTAL LENGTH (m)	WEIGHT (Kg)	LENGTH OF BAR (mm)	NOS.	TOTAL LENGTH (m)	WEIGHT (Kg)	LENGTH OF BAR (mm)	NOS.	TOTAL LENGTH (m)	WEIGHT (Kg)	LENGTH OF BAR (mm)	NOS.	TOTAL LENGTH (m)	WEIGHT (Kg)	LENGTH OF BAR (mm)	NOS.	TOTAL LENGTH (m)	WEIGHT (Kg)	
24	S=1870 C=1870	(12+2)2 = 28	1413	2X28 =56	79·13	71·22	1413	56	79·13	71·22	746	7X28 =196	146·22	58·49	1743	208	362·54	217·52	446	17X52 =884	394·26	157·70	604.96
21	S=1780 C=1775	(11+2)2 = 26	1413	2X26 =52	73·48	66·13	1413	52	73·48	66·13	746	7X26 =182	135·77	54·31	1653* 1648**	32* 160**	316·58	189·95	446	16X48 = 768	342·53	137·01	539.21
18	S=1831 C=1831	(9 +2)2 = 22	1413	2X22 =44	62·17	55·95	1413	44	62·17	55·95	746	7X22 =154	114·88	45·95	1704	160	272·64	163·58	446	17X40 = 680	303·28	121·31	464 08
16	S=1820 C=1810	(8+2)2 = 20	1413	2X20 =40	56·52	50·87	1413	40	56·52	50·87	746	7X20 =140	104·44	41·78	1693* 1683**	32* 112**	242 67	145·60	446	17X36 = 612	272·95	109·18	418.22
14	S=1800 C=1785	(7+2)2 =18	1413	2X18 =36	50·87	45·78	1413	36	50·87	45·78	746	7X18 =126	94·00	37·60	1673* 1658**	32* 96**	212·70	127·62	446	17X32 = 544	242·62	97·05	371.52
12	S=1760 C=1758	(6+2)2 =16	1413	2X16 =32	45·22	40·70	1413	32	45·22	40·70	746	7X16 =112	83·55	33·42	1633* 1631**	32* 80**	182·74	109·64	446	16X28 = 448	199·81	79·92	319 60
10	S=1719 C=1718	(5+2)2 =14	1413	2X14 =28	39·56	35·60	1413	28	39·56	35·60	746	7X14 = 98	73·11	29·24	1592* 1591**	32* 64**	152·77	91·66	446	16X24 =384	171·26	68·51	273.64

MKD	DATE	DESCRIPTION	BY
		REVISION	

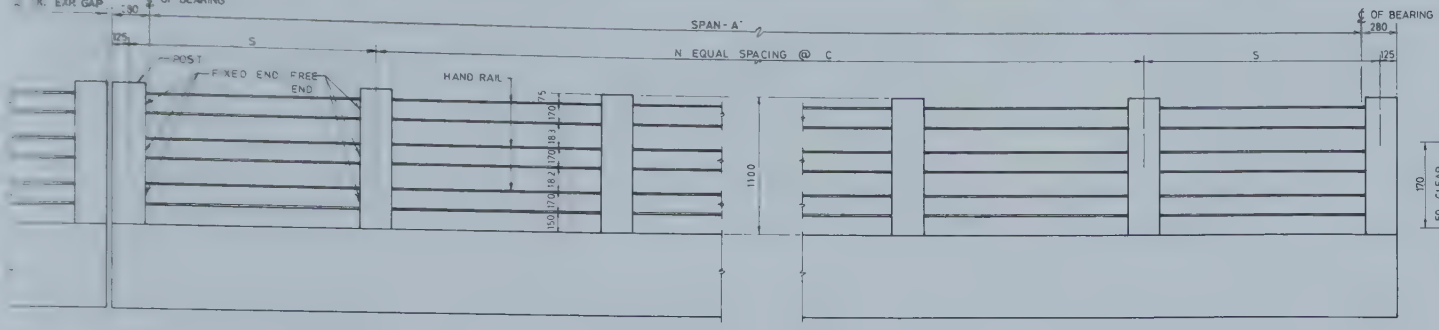
GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
(ROADS WING), NEW DELHI.

STANDARD DRAWINGS FOR ROAD BRIDGES

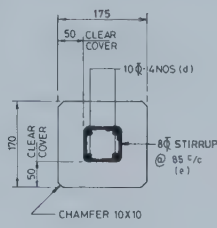
R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE
DETAILS OF R.C.C. RAILINGS
FOR BRIDGES WITHOUT FOOTPATHS.

RECOMMENDED BY:		APPROVED BY:	1991
(M P MARWAH) E E.	(N K SINHA) S.E	(M K MUKHERJEE) C.E.	DRG NO SD/ 201.

DRG. NO. SD/ 202



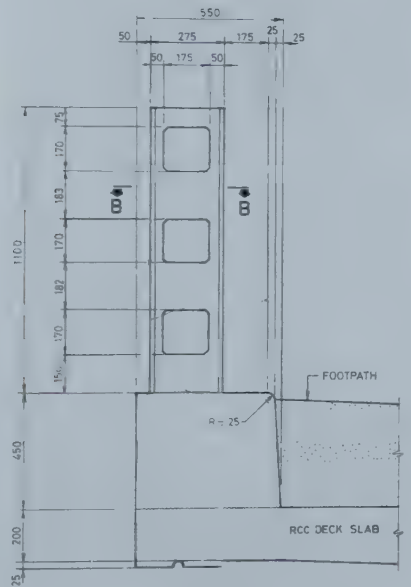
ELEVATION



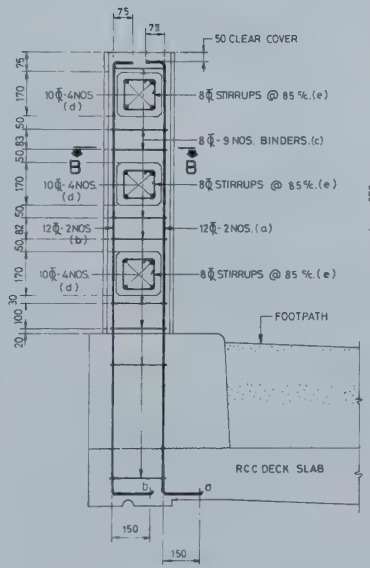
SECTION - A.A

NOTES

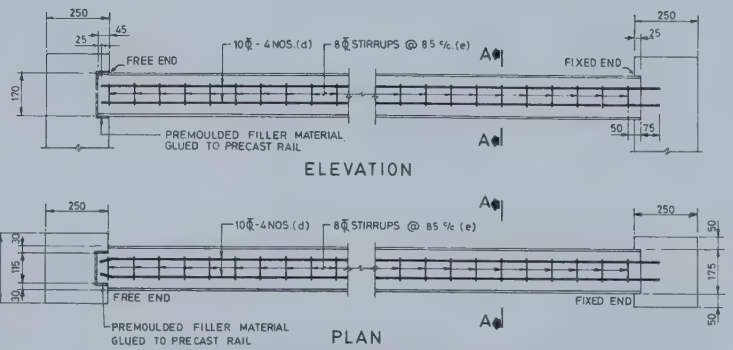
1. Centre to centre spacing between successive vertical posts shown in the elevation shall be adjusted to suit the length of bridge span for which the railing is used but in no case it shall exceed 1870 mm.
2. Reinforcement of railing post should be suitably anchored in deck slab.
3. Casting of post shall be done in single pour after accurately positioning the precast handrail.
4. Railing shall be constructed only after the structural concrete of superstructure has hardened and shuttering is released.
5. In case other type of railing is used the weight of same on each side shall not exceed 3 KN per metre
6. Expansion gaps in railing shall be provided at the same locations as in the deck slab
7. This drawing is to be read in conjunction with following drawing.
   i) General notes ..., Drg. No SD/200



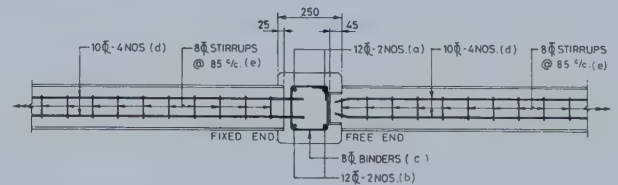
SECTION THROUGH POST
(DIMENSIONS ONLY)



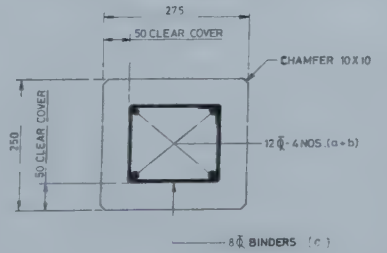
SECTION THROUGH POST



DETAIL OF PRECAST HANDRAIL



REINFORCEMENT ARRANGEMENT OF HANDRAIL & POST



SECTION-B B

* = FOR END SPAN
** = FOR CENTRAL SPAN
S = END SPAN
C = CENTRAL SPAN

BAR BENDING SCHEDULE FOR HANDRAIL AND POST FOR DIFFERENT SPANS

SPAN A (m)	SPACING OF POSTS (mm)	NO. OF POSTS	BAR MARK (a) 12 ϕ - 2 NOS PER POST				BAR MARK (b) 12 ϕ - 2 NOS. PER POST				BAR MARK (c) 8 ϕ BINDERS 9 NOS. PER POST				BAR MARK (d) 10 ϕ - 4 NOS. PER RAIL				BAR MARK (e) 8 ϕ STIRRUPS @ 85 c/c PER RAIL				TOTAL WEIGHT (INCLUDING 5% FOR LAPS AND WASTAGE) (kg)
			LENGTH OF BAR (mm)	NOS	TOTAL LENGTH (m)	WEIGHT (Kg.)	LENGTH OF BAR (mm)	NOS	TOTAL LENGTH (m)	WEIGHT (Kg.)	LENGTH OF BAR (mm)	NOS	TOTAL LENGTH (m)	WEIGHT (Kg.)	LENGTH OF BAR (mm)	NOS.	TOTAL LENGTH (m)	WEIGHT (Kg.)	LENGTH OF BAR (mm)	NOS.	TOTAL LENGTH (m)	WEIGHT (Kg.)	
24	S = 1870 C = 1870	(12+2)2 = 28	1803	2X28 = 56	100·97	90·87	1803	56	100·97	90·87	746	9 X 28 = 252	187·99	75·20	1743	312	543·82	326·29	386	20X78 =1560	602·16	240·86	865·29
21	S = 1780 C = 1775	(11+2)2 = 26	1803	2X26 = 52	93·76	84·38	1803	52	93·76	84·38	746	9 X 26 = 234	174·56	69·82	1653* 1648**	48* 240**	474·86	284·92	386	19 X 72 =1368	528·05	211·22	771·46
18	S = 1831 C = 1831	(9+2)2 = 22	1803	2X22 = 44	79·33	71·40	1803	44	79·33	71·40	746	9 X 22 =198	147·71	59·08	1704	240	408·96	245·38	386	20X60 = 1200	463·20	185·28	664·17
16	S = 1820 C = 1810	(8+2)2 = 20	1803	2X20 = 40	72·12	64·91	1803	40	72·12	64·91	746	9 X 20 = 180	134·28	53·71	1693* 1683**	48* 168**	364·01	218·41	386	20X54 =1080	416·88	166·75	597·12
14	S = 1800 C = 1785	(7+2)2 = 18	1803	2X18 = 36	64·91	58·42	1803	36	64·91	58·42	746	9 X 18 =162	120·85	48·34	1673* 1658**	48* 144**	319·06	191·44	386	20X48 = 960	370·56	148·22	530·08
12	S = 1760 C = 1758	(6+2)2 = 16	1803	2X16 = 32	57·70	51·93	1803	32	57·70	51·93	746	9 X 16 =144	107·42	42·97	1633 * 1631 *	48 * 120 *	274·10	164·46	386	19X42 = 798	308·03	123·21	456·23
10	S = 1719 C = 1718	(5+2)2 = 14	1803	2X14 = 28	50·48	45·43	1803	28	50·48	45·43	746	9X14 =126	94·00	37·60	1592 * 1591 **	48 * 96 *	229·15	137·49	386	19 X 36 = 684	264·02	105·61	390·14

MKD	DATE	DESCRIPTION	EY
		REVISION	

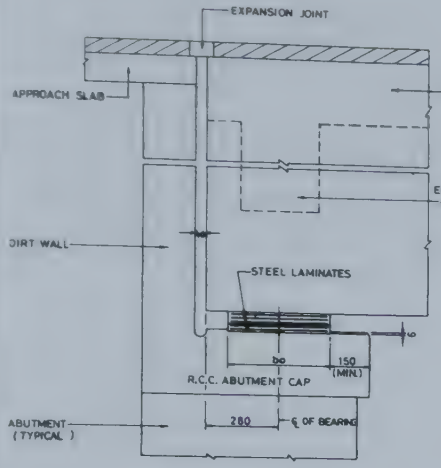
GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
(ROADS WING), NEW DELHI.

STANDARD DRAWINGS FOR ROAD BRIDGES

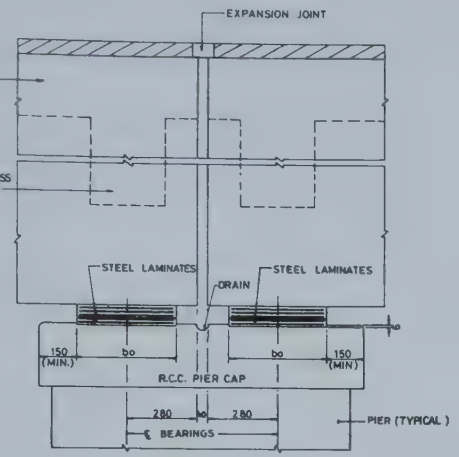
R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE
DETAILS OF R.C.C. RAILINGS FOR BRIDGES WITH FOOTPATHS.

RECOMMENDED BY :		APPROVED BY :	1991
(M. R. MARWAH) E E.	(N. K. SINHA) S.E.	(M. K. MUKHERJEE) C.E	DRG. NO. SD/ 202.

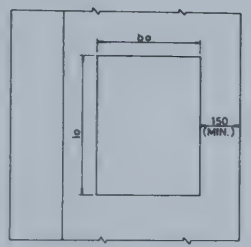
Drg. No. SD/ 203



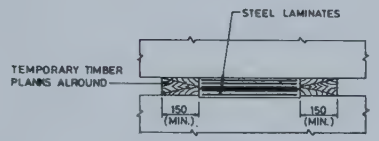
BEARING AT ABUTMENT



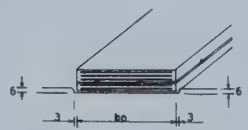
BEARINGS AT PIER



PLAN

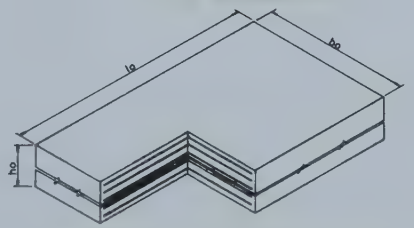


TEMPORARY TIMBER PLANKS FOR INSTALLATION



DETAIL OF RECESS

TYPICAL SECTION OF ELASTOMERIC BEARING



ISOMETRIC VIEW OF ELASTOMERIC BEARING

SPAN (m)	lo (mm)	bo (mm)	ho (mm)	NO. OF INTERNAL LAYERS OF ELASTOMER 'n'	NO. OF STEEL LAMINATE	hi (mm)	hs (mm)	he (mm)	c (mm)	MINIMUM STRENGTH OF CONCRETE OF SUBSTRUCTURE BELOW BEARINGS
24·00	560	400	96	5	6	12	4	6	6	M 30
21·00	500	400	96	5	6	12	4	6	6	M 30
18·00	500	360	96	5	6	12	4	6	6	M 30

INSTALLATION INSTRUCTIONS.

1. Care shall be taken in packing, transportation, storage and handling to avoid any mechanical damage, contamination with oil, grease and dirt, undue exposure to sunlight and weather.
2. The bearings shall be placed in a recess as shown in the drawing.
3. The position of the bearings shall be accurately marked on pier/ abutment cap and the area where the bearings will be seated accurately levelled.
4. The concrete surface shall be free from any loose material and cleaned of any grease, oil, paint etc. and it shall be dry at the time of fixing of bearing. The surface shall be sand blasted, clean of all laitance and levelled true.
5. Bearings must be placed between true horizontal surfaces (maximum tolerance 0·2 per cent perpendicular to load) and at true plan position of their control lines marked on receiving surfaces (maximum tolerance ± 3 mm). Concrete surfaces shall be free from local irregularities (maximum tolerance ± 1 mm in height).
6. Where bearings are installed prior to its concreting, the forms around the bearings shall be soft enough for easy removal. Forms shall also fit the bearings snugly and prevent any leakage of mortar grout. Any mortar contaminating the bearings during concreting shall be completely removed before setting.
7. The temporary forms shall be removed after the superstructure concrete has set. The sides of the bearings shall be cleaned of any deposit of cement slurry / concrete.

MAINTENANCE

1. The bearings shall be subjected to planned maintenance care.
2. The exposed bearing surface shall be maintained clean and free from contamination with grease or oil, etc.
3. Annual routine maintenance inspection or special maintenance inspection of all bearings shall be made to check for any surface cracking or signs of damage, deterioration or distress.
4. Damaged bearings shall be replaced immediately. To avoid differences in stiffness, all adjacent bearings on the same line of support shall also be replaced and uniform seating of the main girders over all the new bearings shall be ensured.
5. Procedure of jacking of girders shall be as indicated in notes of the cross girder drawing.

NOTES

1. Specifications including permissible tolerances for the Elastomeric Bearings shall be in accordance with IRC:83 (part II) 1987 standard specifications and code of practice for Road Bridges Section IX part II- Elastomeric Bearings.
2. The design of elastomeric bearings is applicable to the bridges in the zone indicated below (Refer. cl. 222 of IRC:6-1966 (1985 Reprint).

Zones	Applicability to bridges
I and II	all bridges
III and IV	all bridges up to total length of 60 m.
III and IV [where Horizontal seismic co-efficient $(\alpha\beta\lambda) \leq 0{\cdot}075$]	bridges more than 60 m length.

3. Raw Material : Chloroprene (CR) shall only be used in manufacture of bearings.

3·1 Grades of raw elastomer of proven use in elastomeric bearings, with low crystallisation rates and adequate shelf life (e.g. Neoprene WRT, Bayprene 110 or equivalent) shall be used. No reclaimed rubber or vulcanised wastes shall used. The raw elastomer content of the compound shall not be lower than 60 per cent. The ash content shall not exceed 5 per cent. (As per tests conducted in accordance with ASTM D-297). EPDM and other similar candidate elastomers for bridge bearing use shall not be permitted.

4. Fabrication, testing and acceptance of bearings shall be in accrodance with IRC:83 (part II) 1987.
5. Elastomeric bearings should not be used in areas where the minimum temperature goes below (–) 10°C.
6. Bearings shall be handled carefully. These shall be protected from bright sun light and extreme cold. These shall be stored neatly under cover till installation.
7. This drawing shall be read in conjunction with drg. nos.
   i, General notes..... Drg. No. SD/200
   ii, Drawings for General Arrangement, Details of longitudenal girders and Details for cross girders for the corresponding spans.
8. Bearings shall be procured only from prequalified manufactures.

MKD	DATE	DESCRIPTION	BY
REVISION			

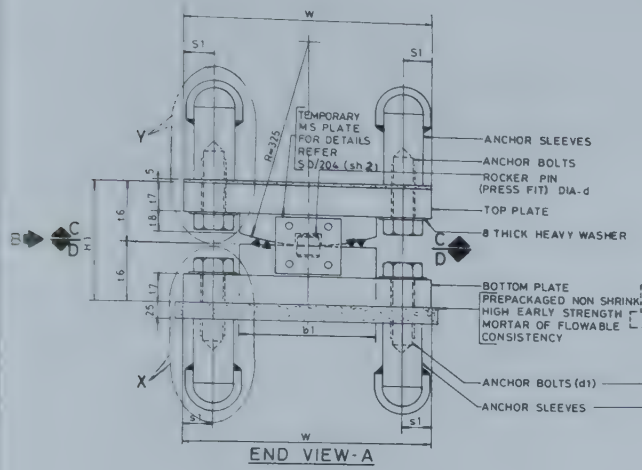
GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
(ROADS WING), NEW DELHI

STANDARD DRAWINGS FOR ROAD BRIDGES

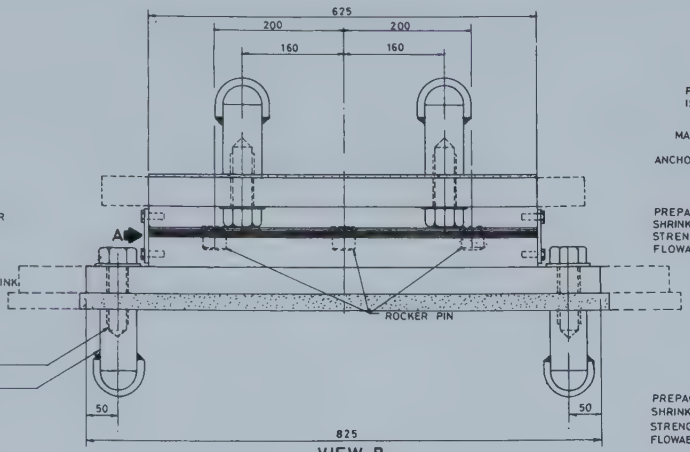
R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE WITH AND WITHOUT FOOTPATHS DETAILS OF ELASTOMERIC BEARINGS

RECOMMENDED BY:		APPROVED BY	1991
(M. P. MARWAH) E.E.	(N. K. SINHA) S.E.	(M. K. MUNHERJEE) C.E.	DRG. NO. SD/203

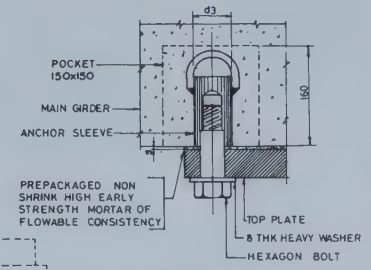
DRG. NO. SD/204 (sh-1)



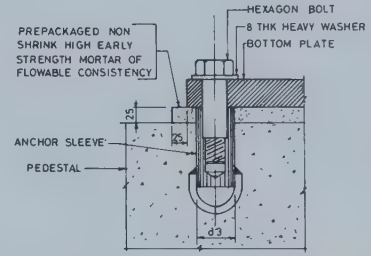
END VIEW-A



VIEW-B



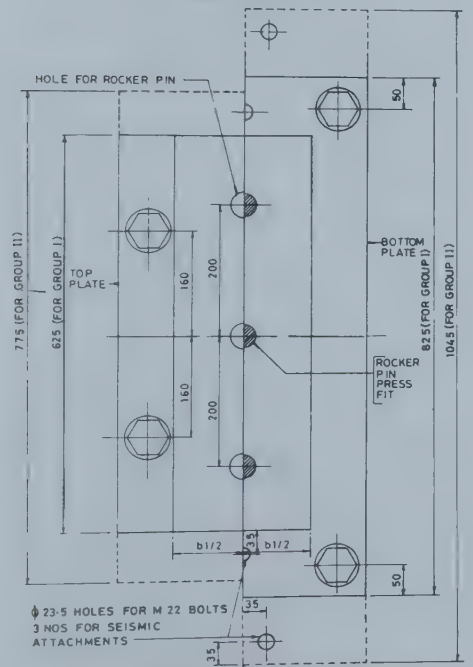
DETAIL-Y



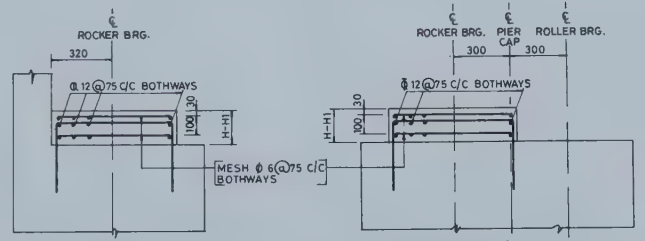
DETAIL-X

NOTES

1. This drawing shows bearings without any vertical seismic attachment.
2. If it is required to provide vertical seismic attachment additional fixtures as shown in drawing no. SD/204 (sh-3) will have to be connected with the bearings.
3. This drawing shall be read in conjunction with the following drawings of respective spans:
   i) General arrangement (with/without footpaths)
   ii) Details of longitudinal girders.
   iii) Details of cross girders.
4. Drg. no. SD/204 (sh-2) is a complementary drawing to this drawing.
5. For all other notes refer. drg. no. SD/204 (sh-3).

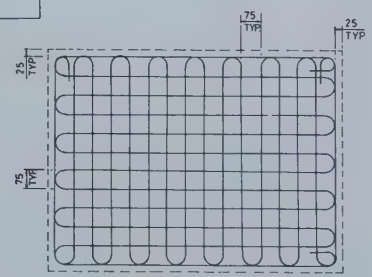


HALF PLAN AT C/C ◆ HALF PLAN AT D-D



SECTION-E

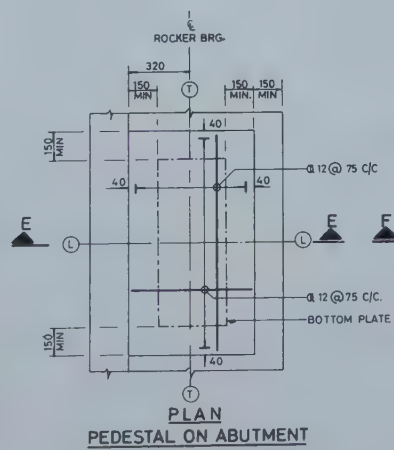
SECTION-F



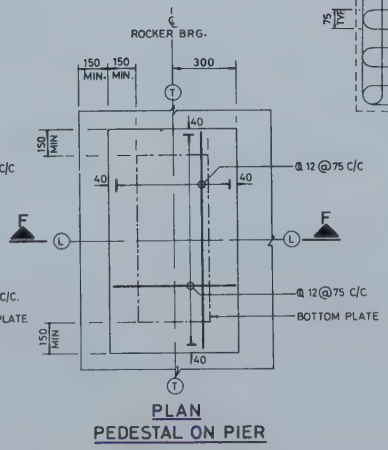
φ 6 MESH REINFORCEMENT IN PEDESTAL

TABLE SHOWING DIMENSIONS OF DIFFERENT PARTS

NOTATIONS	24.0M. SPAN (mm)	21.0M. SPAN (mm)	18.0M. SPAN (mm)	16.0M. SPAN (mm)	14.0M. SPAN (mm)	12.0M. SPAN (mm)	10.0M. SPAN (mm)
W	380	350	320	310	280	280	260
b1	210	180	160	170	140	140	130
t6	95	90	80	80	70	70	65
t7	45	45	40	40	35	35	35
t8	32	32	30	29	27	27	24
s1	45	45	45	40	40	40	35
d	36	36	32	32	28	28	25
d1	M30x110	M30x110	M27x105	M 2[illegible] X100	M24x95	M24x95	M22x95
d3 ø	56	56	56	50	50	50	50
H1	190	180	160	160	140	140	130



PLAN
PEDESTAL ON ABUTMENT



PLAN
PEDESTAL ON PIER

MKD	DATE	DESCRIPTION	BY
		REVISIONS	

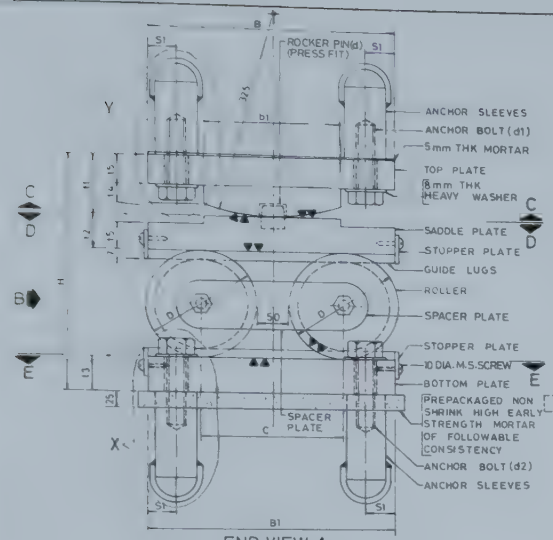
GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
(ROADS WING), NEW DELHI.

STANDARD DRAWINGS FOR ROAD BRIDGES.

R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE
WITH AND WITHOUT FOOTPATHS
DETAILS OF ROCKER AND ROLLER BEARINGS
(ROCKER BEARING)

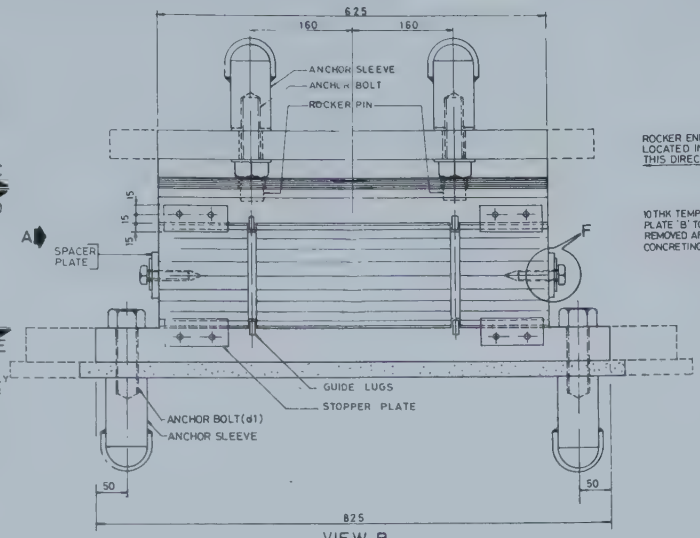
RECOMMENDED BY:		APPROVED BY	1991
A.N DHODAPKAR E.E.	(N.K. SINHA) S.E.	(M.K. MUKHERJEE) C.E	DRG. NO. SD/204 (sh-1)

SD/204 (Sh-2)

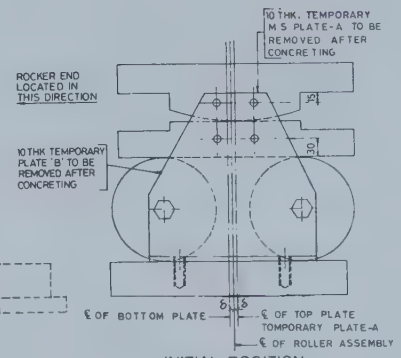


END VIEW-A

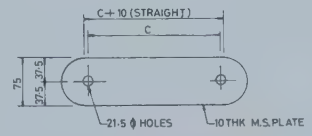
(FOR DETAILS X & Y REFER DRG.NO-SD/204 SH-1)



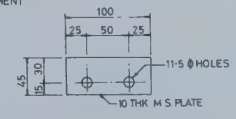
VIEW-B


10 THK. TEMPORARY M.S PLATE-A TO BE REMOVED AFTER CONCRETING
ROCKER END LOCATED IN THIS DIRECTION
10 THK TEMPORARY PLATE 'B' TO BE REMOVED AFTER CONCRETING
℄ OF BOTTOM PLATE
℄ OF TOP PLATE TOMPORARY PLATE-A
℄ OF ROLLER ASSEMBLY

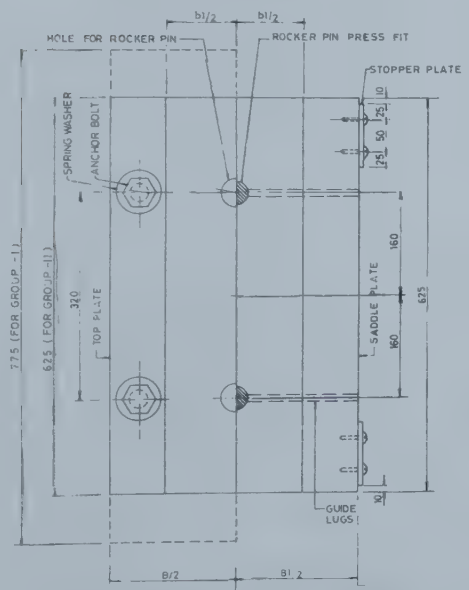
INITIAL POSITION



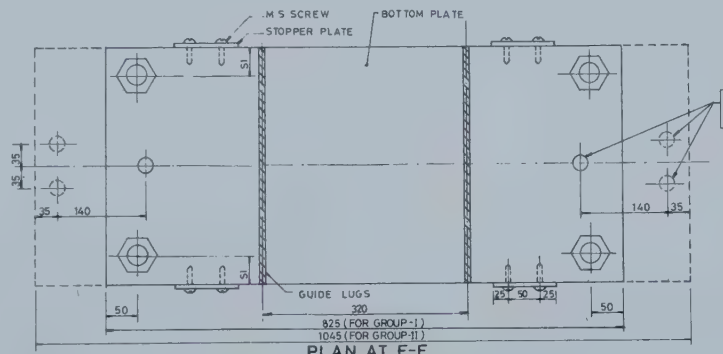
DETAIL OF SPACER PLATE



DETAIL OF STOPPER PLATE

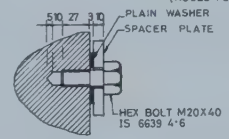


HALF PLAN AT C-C ◆ HALF PLAN AT D-D

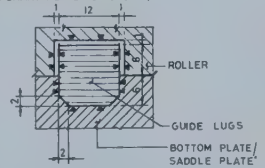


PLAN AT E-E

(HOLES FOR TEMPORARY PLATE NOT SHOWN)

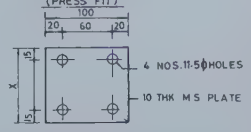


DETAIL-F

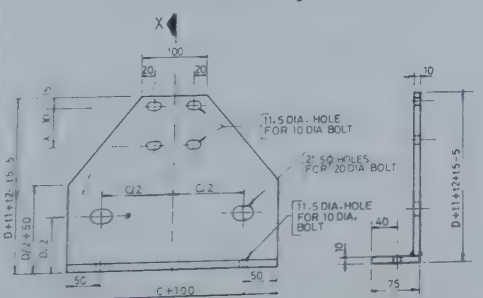


DETAIL OF GUIDE LUGS

TYP. HEXAGON BOLT CONFORMING TO IS:6639

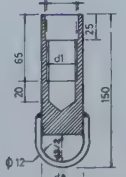


TEMPORARY M.S. PLATE-A

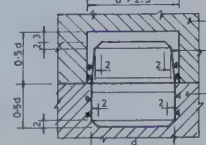


TEMPORARY PLATE-B

SECTION-X



TYP. ANCHOR SLEEVE



DET. OF ROCKER PIN

TABLE SHOWING DIMENSIONS OF DIFFERENT PARTS

NOTATIONS	24·0M. SPAN (mm)	21·0M. SPAN (mm)	18·0M. SPAN (mm)	16·0M. SPAN (mm)	14·0M SPAN (mm)	12·0M SPAN (mm)	10·0M SPAN (mm)
B	380	350	320	310	280	280	260
B1	380	350	320	310	300	280	260
b1	210	180	160	170	140	140	130
C	220	210	200	200	190	180	160
D	170	160	150	150	140	130	110
d	36	36	32	32	28	28	25
d1	M30X 110	M30X 110	M27X 105	M24X 100	M24X 95	M24X 95	M22X 95
d2	M30X 120	M30X 120	M27X 115	M24X 110	M24X 110	M24X 105	M22X 100
d3	56	56	56	50	50	50	50
t1	95	90	80	80	70	70	65
t2	55	55	50	50	50	45	40
t3	55	55	50	50	50	45	40
t4	32	32	30	29	28	28	24
t5	45	45	40	40	35	35	35
X	90	80	70	70	60	60	55
s1	50	50	45	40	40	40	35
H	375	360	330	330	310	290	255
ϕ	16	16	16	12	12	12	12
INITIAL SETTING OF ROLLER ASSEMBLY							
δ	1.2	1.1	0.9	0.8	0.7	0.6	0.5

NOTES

1. This drawing shows bearings without any vertical seismic attachment.
2. If it is required to provide vertical seismic attachment, additional fixtures as shown in drawing no. SD/204 (Sh-3) will have to be connected with the bearings
3. This drgawing shall be read in conjunction with the following drawings of respective spans :
   i) General arrangement (with / without footpath)
   iii) Details of longitudinal girders.
   iv) Details of cross girders
4. Drg. No. SD/204 (Sh.-1) is a complementory drawing to this drawing.
5. For other notes refer Drg. No..... SD/204 (Sh-3)

MKD	DATE	DESCRIPTION	BY

REVISIONS

GOVERNMENT OF INDIA

MINISTRY OF SURFACE TRANSPORT

(ROAD WING), NEW DELHI

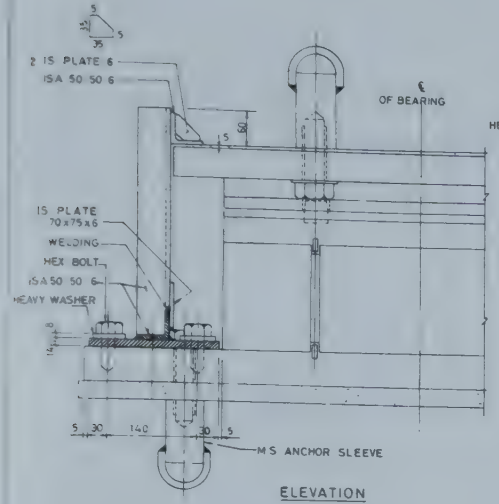
STANDARD DRAWINGS FOR ROAD BRIDGES.

R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE WITH AND WITHOUT FOOTPATHS

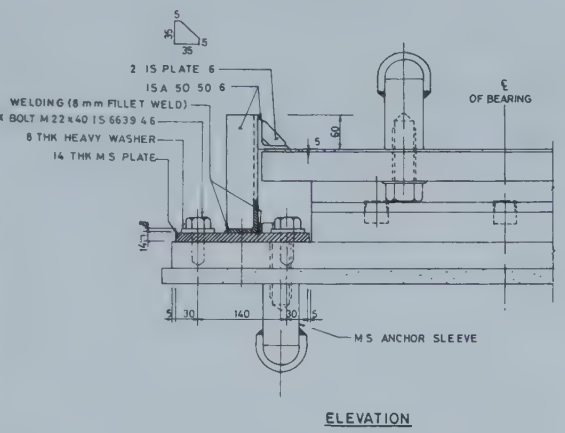
DETAILS OF ROCKER AND ROLLER BEARINGS

(ROLLER BEARING)

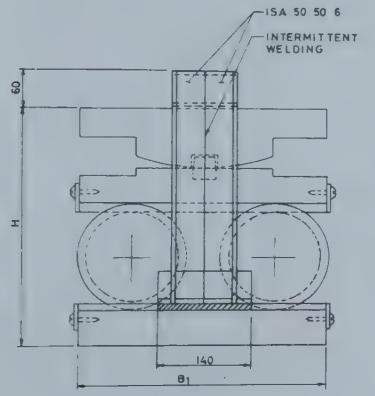
RECOMMENDED BY		APPROVED BY	1991
(A.N. DHODAPKAR) E.E.	(N. K. SINHA) S.E.	(M.K. MUKHERJEE) C.E.	DRG. NO SD/204 (Sh-2)



ELEVATION

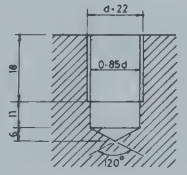

2 IS PLATE 6
ISA 50 50 6
WELDING (8 mm FILLET WELD)
HEX BOLT M 22 x 40 IS 6639 4.6
8 THK HEAVY WASHER
14 THK M.S PLATE
℄ OF BEARING
M.S ANCHOR SLEEVE

ELEVATION

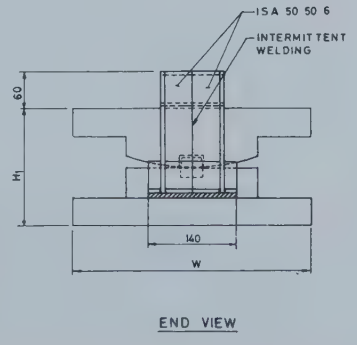


END VIEW

VERTICAL SEISMIC ATTACHMENT TO ROLLER BEARING



INTERNAL THREADING DETAILS FOR M22 BOLT



END VIEW

VERTICAL SEISMIC ATTACHMENT TO ROCKER BEARING

MATERIAL REQUIREMENT FOR VERTICAL SEISMIC ATTACHMENT (IN KGS)

	ROLLER BEARINGS							ROCKER BEARINGS						
SPAN (M)	24·0	21·0	18·0	16·0	14·0	12·0	10·0	24·0	21·0	18·0	16·0	14·0	12·0	10·0
ISA 50 x 50 x 6	79	76	72	72	68	66	60	48	46	43	43	40	40	39
PLATES (M.S)	70	70	70	70	70	70	70	70	70	70	70	70	70	70
HEX BOLTS (NOS.)	6	6	6	6	6	6	6	6	6	6	6	6	6	6
HEAVY WASHERS (NOS.)	6	6	6	6	6	6	6	6	6	6	6	6	6	6

MATERIAL DETAILS

S. NO.	COMPONENT	MATERIAL	CODE OF REFERENCE
1	BOTTOM PLATE	CAST STEEL	IS: 1030
2	SADDLE PLATE	"	"
3	TOP PLATE	"	"
4	ROLLERS	FORGED STEEL	IS: 1875 - MAT. IS: 2004 - FORGING
5	GUIDE LUGS	"	"
6	ROCKER PINS	"	"
7	ANCHOR SLEEVES	MILD STEEL	IS: 226
8	TEMPORARY PLATES	"	"
9	SPACER PLATE	"	"
10	STOPPER PLATE	"	"
11	SEISMIC ATTACHMENT	"	"
12	ANCHOR BOLT HEX BOLT	M.S PROP CLASS 4.6	IS: 6639
13	SCREWS	M.S	"
14	PLAIN WASHERS	M.S	IS: 2016
15	HEAVY WASHER	M.S	IS 6610
16	WELDING	8 mm FILLET	IS: 816

REPLACEMENT OF BEARINGS

Replacement wherever required shall be done for the complete bearings.

Bearings shall be replaced (if required) in the following sequence.

i) Dismantle vertical seismic attachment, wherever provided.

ii) Loosen the anchor bolts of the top and bottom plates slightly.

iii) Lift the superstructure to such an extent that the top plate is free from rocker pin.

iv) Unscrew all the anchor bolts fully and take out the bearing components

v) Place the new assembly of bearing to proper line and levels. Insert the anchor bolts and tighten the same slightly.

iv) Lower the superstructure gradually and check once again the line and levels of bearing assembly before final seating. If found satisfactory lower the superstructure fully and tighten all the anchor bolts to full extent.

NOTES

SD/204 (Sh-3)

1. Grade of concrete mix for pedestal at bottom of bearing plate shall be M 30. Pedestal shall be provided only under the rocker bearing.
2. Grade of concrete for Bearing beam shall also be M 30
3. All rolling, rocking and sliding surfaces are shown thus ▲▲
4. Workmanship and tolerances of various components shall be in accordence with clause 908 of IRC: 83-1982 (part I)
5. All components of the bearing shall be manufactured as per provisions given in IRC: 83-1982 (part I). Complete assembly of the bearing(s) shall be obtained from approved manufacturers
6. Testing of the bearing(s) shall conform to provisions laid down in clause 909 of IRC: 83-1982 (part I)
7. Presence of manufacturer's representative at the time of installation of bearing(s) is mandatory.
8. M.S. Sleeves to receive anchor bolts shall be given hot dipped galvanized coating before installation.
9. Placing and positioning of the bearings shall conform to clause 910 of IRC: 83-1982 (Part I)
10. Temporary plates as shown on the drawing No. SD/204 (sh. 1 and 2) shall be fixed to the bearing before concreting of the superstructure. These must be removed immediately after concreting has been completed.
11. Vertical seismic attachment shown in this drawing shall be provided for all bridges located in seismic zone IV and V as indicated in Fig. 8 of IRC: 6-1966 (1985 Reprint)
12. Space between the bottom plate and pedestal as well as between top plate and soffit of girder shall be grouted with pre-packaged non-shrink high early strength mortar for all the bearings.
13. Inspection and maintanance during service shall be carried out as per clause 911 of IRC: 83-1982 (part I).
14. Group I Seismic Zone I II and III
    Group II Seismic Zone IV and V

MATERIAL REQUIREMENT (IN KGS)

	SEISMIC ZONE I, II, III (GROUP I)														SEISMIC ZONE IV V (GROUP II)													
BEARINGS	ROLLER							ROCKER							ROLLER							ROCKER						
SPAN (M)	24·0	21·0	18·0	16·0	14·0	12·0	10·0	24·0	21·0	18·0	16·0	14·0	12·0	10·0	24·0	21·0	18·0	16·0	14·0	12·0	10·0	24·0	21·0	18·0	16·0	14·0	12·0	10·0
TOP PLATE	128·9	112·8	91·3	90·9	70·1	70·1	62·4	128·7	112·6	91·2	90·8	70·0	70·0	62·3	149	131·3	106·4	105·5	81·6	81·6	73·1	148·8	131·1	106·3	105·4	81·5	81·5	73
BOTTOM PLATE	135·4	124·7	103·6	100·4	97·1	81·6	67·4	161·8	141·3	114·0	113·4	87·3	87·3	76·5	171·5	157·9	131·3	127·2	123·1	103·4	85·3	191·4	168·5	136·1	134·8	104·2	104·2	92·2
SADDLE PLATE	93·5	85·5	70·1	68·7	61·4	54·5	47·5								93·5	85·5	70 1	68 7	61 4	54·5	47·5							
ROLLERS	221·1	195·8	172 0	172 0	149·8	129·1	92·3								221·1	195·8	172·0	172·0	149·8	129·1	92·3							
ROCKER PINS	0·6	0·6	0·4	0·4	0·3	0·3	0·2	0·8	0·8	0·6	0·6	0·4	0·4	0·3	0·6	0·6	0·4	0·4	0·3	0·3	0·2	0·8	0·8	0·6	0·6	0·4	0·4	0·3
GUIDE LUGS	1·7	1 5	1·4	1 4	1·3	1·2	1 1								1·7	1·5	1·4	1·4	1·3	1·2	1·1							
SPACER PLATE	3·6	3·5	3 4	3 4	3 2	3·1	2·9								3·6	3·5	3·4	3·4	3·2	3·1	2·9							
STOPPER PLATE	2·8	2·8	2·8	2·8	2·8	2·8	2·8								2·8	2·8	2·8	2·8	2·8	2·8	2·8							
ANCHOR PLATES (NOS	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
ANCHOR SLEEVES	29·5	29·5	29·5	23·5	23·5	23·5	23·5	29·5	29·5	29·5	23·5	23·5	23·5	23·5	29·5	29·5	29·5	23·5	23·5	23·5	23·5	29·5	29·5	29·5	23·5	23·5	23·5	23·5
HEAVY WASHER (NOS.)	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
TEMPORARY PLATE 'A'								1·4	1·3	1·1	1·1	0·9	0·9	0·9								1·4	1·3	1·1	1·1	0·9	0·9	0·9
TEMPORARY PLATE 'B'	14·5	13·5	12·4	12·4	11·5	10·6	8·9								14·5	13·5	12·4	12·4	11·5	10·6	8·9							
HEX BOLTS M 20 (NOS)	4	4	4	4	4	4	4								4	4	4	4	4	4	4							
PLAIN WASHERS (NOS)	4	4	4	4	4	4	4								4	4	4	4	4	4	4							
SCREWS	28	28	28	28	28	28	28	8	8	8	8	8	8	8	28	28	28	28	28	28	28	8	8	8	8	8	8	8

MKD	DATE	DESCRIPTION	BY
		REVISION	

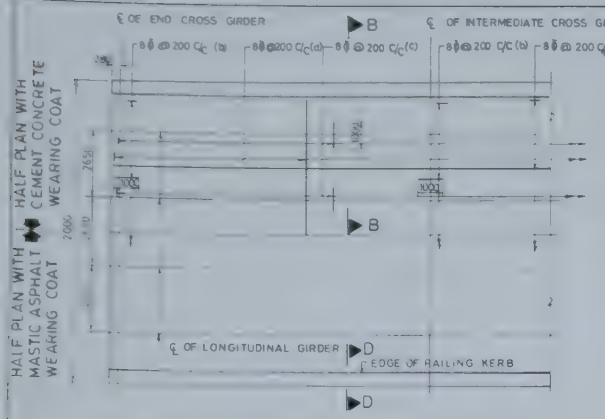
GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
(ROADS WING) NEW DELHI

STANDARD DRAWINGS FOR ROAD BRIDGES

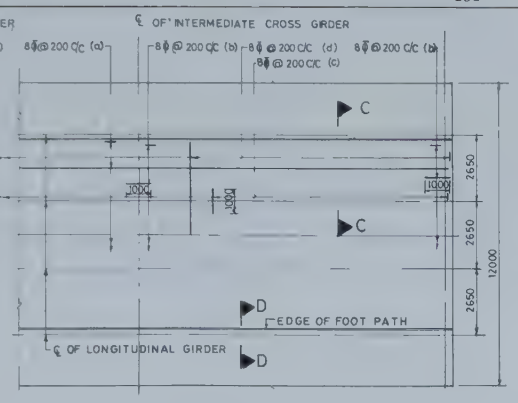
R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE WITH AND WITHOUT FOOTPATHS DETAILS OF ROCKER AND ROLLER BEARINGS (VERTICAL SEISMIC ATTACHMENT)

RECOMMENDED BY		APPROVED BY	1991
A.N. DHODAPKAR EE	N.K SINHA SE	(M.K MUKHERJEE) CE	DRG NO. SD/204 (Sh-3)

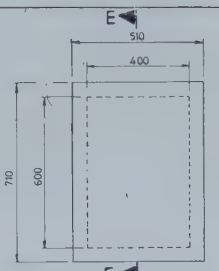
DRG. NO. SD / 205


℄ OF END CROSS GIRDER
℄ OF INTERMEDIATE CROSS GIRDER
HALF PLAN WITH MASTIC ASPHALT WEARING COAT
HALF PLAN WITH CEMENT CONCRETE WEARING COAT
℄ OF LONGITUDINAL GIRDER
EDGE OF RAILING KERB

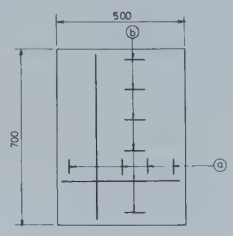
HALF PLAN FOR BRIDGES WITHOUT FOOTPATH



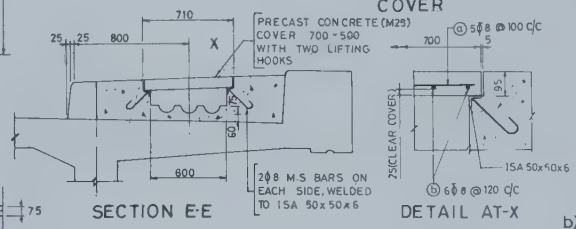
HALF PLAN FOR BRIDGES WITH FOOTPATH



PLAN OF INSPECTION CHAMBER

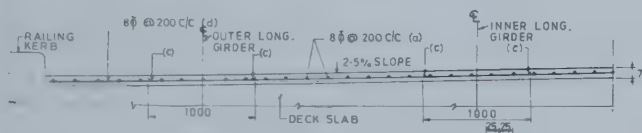


PLAN OF PRECAST CONCRETE COVER

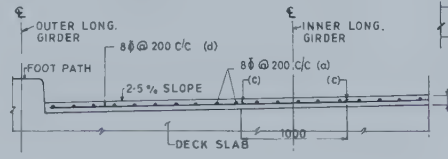

PRECAST CONCRETE (M25) COVER 700 - 500 WITH TWO LIFTING HOOKS
2ϕ8 M.S BARS ON EACH SIDE, WELDED TO ISA 50x50x6
25 CLEAR (COVER)
ISA 50x50x6
6ϕ8 @120 C/C

SECTION E-E

DETAIL AT-X

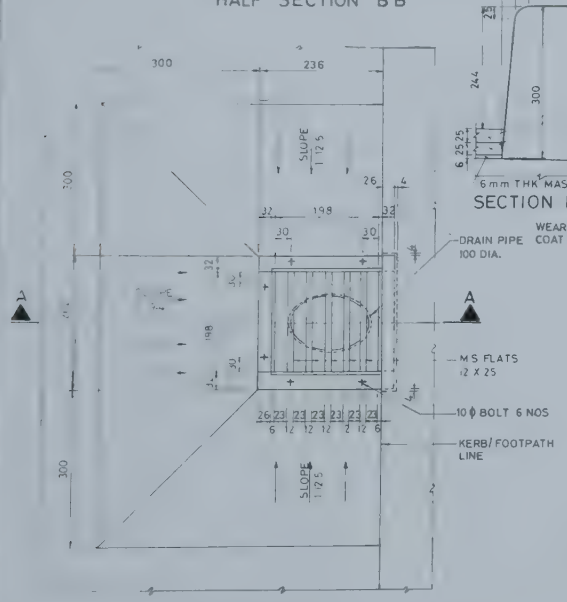


HALF SECTION B B

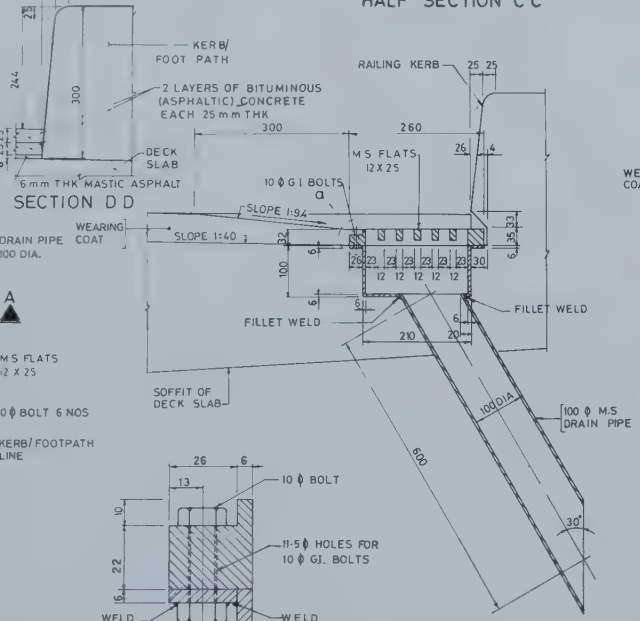


HALF SECTION C C

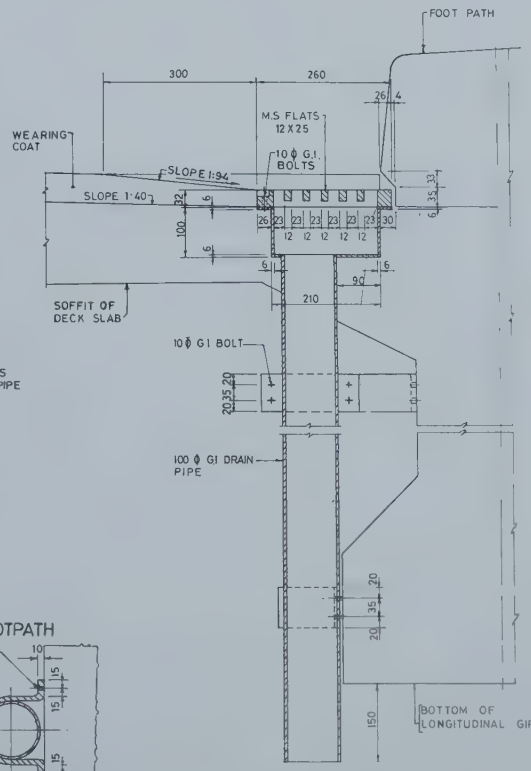
DETAIL OF INSPECTION CHAMBER



PLAN



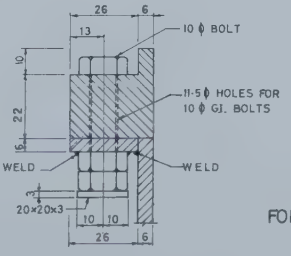
SECTION D D



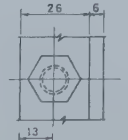
SECTION A-A FOR BRIDGES WITHOUT FOOTPATH

SECTION A-A FOR BRIDGES WITH FOOTPATH

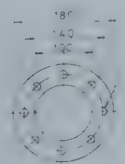
DETAILS OF DRAINAGE SPOUT AND COLLECTION PIT



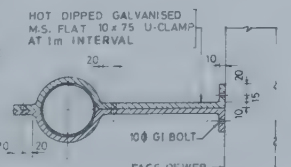
DETAIL-a



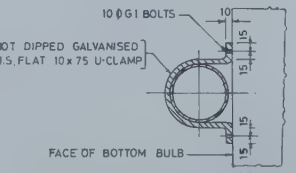
PLAN



TYPICAL DETAIL FOR LENGTHENING DRAINAGE SPOUT



TYPICAL DETAIL OF CONNECTION OF DRAINAGE SPOUT WITH FACE OF WEB



TYPICAL DETAIL OF CONNECTION OF DRAINAGE SPOUT WITH BULB OF GIRDERS

NOTES

1. All dimensions are in millimetres
2. The details shown in this drawing are applicable for R.C.C T-Beam slab Superstructure with and without footpaths.
3. Material specifications and workman-ship shall be in accordance with MOST Specifications for Road and Bridge works (2nd revision 1988) unless stated otherwise in this drawing or drawing No. SD/200
4. Wearing coat shall consist of the following
   a) A coat of mastic asphalt 6mm thick, with a prime coat over the top of the deck before the wearing coat is laid. The prime coat of mastic asphalt shall be 30% straight run 30/40 penetration grade betumen and 50% light solvent (Benzol) to be laid over the deck slab The insulating layer 6mm thick Mastic asphalt with 75% lime stone dust filler and 25% of 30 to 40 penetration grade bitumen shall be laid at 375°F with broom over prime coat
   b) 50 mm thick asphatic concrete wearing coat in two layers of 25mm each as per clause No 512 of MOST Specification for Road and Bridge works (2nd revision 1988).
5. In case of isolated bridge construction or bridges located in remote areas where provision of mastic and asphalt concrete wearing coat is not practicable, the Engineer in charge may permit provision of 75 mm thick cement concrete wearing coat in M 30 grade concrete as shown in the drawing
6. Spacing of drainage spout in different spans will be as shown in the general arrangement drawings of the corresponding spans.
7. Drainage spout and collection pit assembly shall be fabricated from mild steel and after fabrication the complete assembly expect grating shall be given a hot dipped galvanised coating.
8. The fixing clamps will be of hot dipped galvanised M.S flat.
9. Mimimum number of clamps to be provided with vertical drainage spout for fixing to longitudinal girders shall be two
10. Reintorcement in wearing coat will be placed at the centre of the wearing coat.

MKD	DATE	DESCRIPTION
		REVISION

GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
(ROADS WING) NEW DELHI

STANDARD DRAWINGS FOR ROAD BRIDGES

R.C.C. T-BEAM AND SLAB SUPERSTRUCTURE WITH AND WITHOUT FOOTPATHS
DETAILS OF MISCELLANEOUS ITEMS

RECOMMENDED BY		APPROVED	
(M. P. MARWAH) EE	(N.K SINHA) SE	(M.K MUKHERJEE) CE	DRG NO SD / 205